1983-84
ANNUAL
REPORT

PLANT INDUSTRY DIVISION

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Annual Report

Alberta
AGRICULTURE

May, 1984

INTRODUCTION

The Plant Industry Division of Alberta Agriculture is comprised of five branches: Field Crops, Crop Protection, Soils, Tree Nursery and Horticulture, and Horticultural Research. Two branches, namely Crop Protection and Soils, are located at the Department's headquarters in Edmonton. The Field Crops branch is located at Lacombe, the Tree Nursery and Horticulture Centre at Oliver, and the Horticultural Research Center at Brooks.

The Division's main objective is to provide a service in plant and related sciences to the agricultural industry that will be conducive to greater economic and aesthetic returns to those engaged in agriculture. In its broad concept, this service should be compatible with the concept and philosophy of environmental concern and resources conservation. The activities of the five branches are geared towards the overall attainment of these objectives.

This annual report provides some detailed information about the programs carried out by the branches of the Plant Industry Division and about their achievements during the year 1983/84.

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I. PROGRAM OBJECTIVES

A number of programs are carried out by the five branches of the Plant Industry Division. These programs are co-ordinated by the Division's director and his staff. The director's main responsibilities are to provide an overview of policy making in agriculture generally and in the area of plant production in particular. He is also responsible for reviewing the programs of his division and for assessing their compatibility with needs of the industry and with government policy.

The following is a brief summary of the objectives of the various programs carried out by the division's branches.

A. FIELD CROPS BRANCH

The objectives of this branch are:

- To develop new, high-yielding, adapted lines of feed grain varieties for Alberta.

- To develop new, high-yielding, adapted lines of winter wheat and winter and spring triticale for Alberta.

- To obtain performance and adaptability information on new and recommended cultivars of barley, wheat, oats, canola and flax.

- To evaluate varieties and agronomic practices of barley, wheat and triticale for high moisture grain production.

- To promote adaptation of cereal and oilseed varieties and management practices to improve cereal and oilseed production in Alberta.

- To promote pedigreed seed production and technology and to provide this technology to improve pedigreed seed production in Alberta.

- To promote adaptation of forage varieties and management practices of rangeland and tame forage crops to improve forage production in Alberta.

- To study the economic and agronomic advantages of special (alternate) crops in Alberta and to obtain performance and adaptability information on possible alternate crops in order to make variety and production recommendations. To develop the agronomic technology necessary to produce viable seed from alternate crops.

- To administer the Seed Dealer's Act of Alberta.

- To administer the guidelines for assistance to the Municipal Co-op Seed Cleaning Plants in Alberta.

B. CROP PROTECTION BRANCH

The objectives of this branch are:

- To provide services to producers directly and via extension and municipal staff that will enable higher production and lower losses due to pests, predators and weeds. To enforce legislation which the branch is responsible for, and to ensure that each Albertan receives the protection afforded by the legislation. To conduct our operations in a manner which protects the soil, water, plant and animal resources of the province. To provide leadership in the adoption of new technology as appropriate. Wherever possible, we attempt to conduct interdisciplinary approaches to all crop protection functions.

- To transfer technical information to producers directly and indirectly through district agriculturists and agricultural fieldmen. To administer the Weed Control Act as it applies to all of Alberta including urban, rural and industrial land.

To investigate methods and techniques of improving weed control practices, both by ourselves and by liaison with other research institutions. To assist municipalities in the planning and conducting of weed control programs by direct contact, inspection, consultation and supervision.

- To administer the Agricultural Pests Act in a manner that affords reasonable protection to producers while minimizing the negative impacts of these activities.

- To assist in minimizing losses due to plant disease by conducting research into prevention and control. To carry out producer education through the media and via extension staff to enable identification, prevention and treatment of diseases. To provide a consultative and diagnostic service to producers through the operation of regional laboratories. Maintenance of close liaison with other research and training institutions is part of this strategy.

- To operate programs which provide protection for producers against insect predation on crops and livestock. To train field staff, provide publication and reference material on prevention and control of insect pests. To guard against outbreaks of insect pests and co-ordinate their control when preventative programs occasionally fail. To operate an apiculture program that provides extension services, inspection and liaison with Alberta beekeepers.

C. SOILS BRANCH

Its objectives are:

- To increase agricultural production and improve farm incomes by providing the farming public with information and laboratory services related to soil management, soil amendments, and fertilizer use and by establishing applied research projects to solve soil problems involving fertility, acidity and soil structure.

- To encourage the wise and proper use and management of the agricultural soil resources of Alberta through education, and applied research.

- To provide technical expertise and diagnostic capability related to soils, plants and animal feeds for the agricultural industry.

D. ALBERTA TREE NURSERY AND HORTICULTURE CENTRE

The objectives of this centre are:

- To co-ordinate woody plant horticultural research and extension services by supervising the Alberta Tree Nursery and Horticulture Centre. To administer the Provincial Shelterbelt Program, urban and amateur horticultural programs and special projects and programs as required.

- To provide consultative assistance to other sectors of the department, to other government agencies including federal agencies and to horticultural industries.

E. ALBERTA HORTICULTURAL RESEARCH CENTER

The Horticultural Research Center's main objectives are:

- To provide applied research and development expertise and extension information to all parts of the horticultural industry in the province, and to provide horticultural and special crops advice within Alberta Agriculture and to commercial growers and amateur horticulturists.

- To provide applied research and extension services in new and specialty crops grown under irrigation.

- To provide plant diagnostic and extension service to the southern part of Alberta through the Regional Crops Laboratory at Brooks.

- To administer the Alberta Vegetable Sales Act, urban and amateur horticultural programs and special projects.

- To provide assistance to other sectors of the department, to other government agencies and the horticultural industries.

II. PROGRAM SUMMARIES

The programs carried out by the five branches of the Plant Industry Division to achieve their objectives are summarized in this section. A more elaborate discussion of each program can be found in Section III.

A. FIELD CROPS BRANCH

Major extension effort was placed on barley and canola production techniques. Producer survey information and research results were used in this effort.

Seventy-seven municipal co-operative seed cleaning plants processed 28.9 million bushels of cereals and oilseeds. This was the second highest year on record.

New seed cleaning plants were completed at Rosebud and High Level to replace former plants.

A "Canola Production" package was prepared for the Canola Council of Canada for their "Grow with Canola" program.

A new Pedigreed Seed Show was initiated and held in Edmonton which proved highly successful.

A specialized type of rotational grazing called the Savory Grazing Method has been introduced to Alberta.

The forage section participated in foreign missions to China, Eastern Europe and Scandinavia.

The special crops staff initiated work with wild rice, comfrey and Jerusalem artichoke.

A public field day was held on the Field Crops research farm in conjunction with the Federal Research Station. More than 600 visitors attended.

The regional cereal and oilseed variety testing program, funded by Farming for the Future, has, over the last 5 years, accumulated a sizeable data base. This has allowed the number of zones for which recommendations are made to be increased from 4 to 7.

Further review and revisions of the regulations under the Canada Seeds Act were undertaken. The new regulations are to be in place by July 1, 1985.

B. CROP PROTECTION BRANCH

Fiscal 1983/84 was the first full year of operation of the new Crop Protection Branch. Due to government down-sizing, the Branch was reduced from 36 positions to 32. The Branch is responsible for program direction, technical services and applied research in all aspects of field crop protective services and in addition provides production information and regulation for the apiculture industry of the province.

During 1983/84 most of the work to revise the Agricultural Pests Act was completed and the bill has seen second reading in the Legislature at the time of writing.

The Crop Protection Branch carried on a diverse range of programs in weed control, entomology, plant pathology, apiculture, vertebrate pest control, sprayer technology and potato tuber production. The Branch also conducted coyote and rat control programs and worked with the Central Rabies Committee to control this disease in Alberta.

C. SOILS BRANCH

As a result of re-organization, programs involving agro-meteorology, conservation, reclamation and salinity were transferred to another sector. These changes resulted in the need to amalgamate acid and solonetzic soil improvement into a soil management program.

The Agricultural Lime Freight Assistance Program provided over $600,000 in freight assistance grants to 141 applicants transporting 21,700 tonnes of lime and marl. Some changes to the program included separate freight assistance for marl, revised freight schedule, minimum quality standards and a lime requirement report.

Extension and applied research highlighted activities in soil fertility. Sales of unregistered and on proven products remained high. Fertilizer sales increased marginally to 855,560 tonnes in the year ending June 30, 1983.

Applied research to determine feasibility of deep plowing, ripping and liming of solonetzic soils continued. The assessment of various liming materials to correct soil acidity was commenced late in the year.

Total soil and feed sample analyses increased by 11,678 over last year to 49,744 samples. Most of this increase was due to an increase in research project samples. Producer sample numbers remained about the same as last year at 17,721.

D. ALBERTA TREE NURSERY AND HORTICULTURE CENTRE

During the winter months three horticultural short courses per Agriculture region were provided. Direct contacts at the nursery resulted in 4,700 telephone inquiries.

During the spring of 1983, 2.3 million shelterbelt plants were distributed to over 7,000 landowners.

A total of 23,218 native trees were shipped to the various Provincial Parks. The native trees were shipped in 1, 2 and 5 gallon pots.

During the winter months 1.8 million hardwood cuttings of poplar and willow were produced. For every three cuttings made, one rooted plant was harvested in the fall. 600,000 coniferous plants of spruce and pine were produced in the greenhouses. These seedlings were transplanted in the field during August.

Seeding was done in the late spring, summer and fall of 1983.

Applied research projects were carried out; these projects dealt with investigations in:

1. Lawn establishment and maintenance
2. Vegetable testing and production
3. Woody plant production and testing
4. Seed germination and seeding practices
5. Weed control methods for nursery crops

E. ALBERTA HORTICULTURAL RESEARCH CENTER

As a component of the Plant Industry Division of Alberta Agriculture, the Alberta Horticultural Research Center (AHRC) is involved in province-wide extension and research activities relating to all areas of horticulture. In addition to providing this service to the traditional horticultural crop industry, AHRC personnel conduct research and provide extension service to non-traditional horticultural areas such as new or specialty crops grown under irrigation. On and off-site co-operative research projects are being conducted in collaboration with personnel from Agriculture Canada and the University of Alberta, as well as with staff from the Plant Industry and Irrigation Divisions of Alberta Agriculture.

AHRC is composed of five distinct sections, three of which provide

research, development and extension services to specific horticultural and/or commodity sectors. The Environmental Horticulture Section carries responsibility for research into production of tree fruit, small fruit, bush and native fruit, ornamental and nursery stock and greenhouse vegetable and flower crops. The Vegetable and Special Crops Section provides applied research, demonstration and extension assistance for vegetables, potatoes, corn, as well as a variety of new crops such as beans, forages, grain legumes and herbs and spices. In addition to providing technical support for the commodity based programs, the efforts of the Laboratory Services Section are directed toward diagnosis of plant diseases, insect and weed control, crops storage, food processing and product development, and leafcutter and honeybee husbandry. Administrative and operational support for the above three programs is provided by the Administrative Services Section and the Farm Operations Section, respectively.

Test sites for the research extension functions of AHRC staff are located throughout the province. In addition to the utilization of the three farms at Brooks, research/demonstration plots are found in locations such as Bow Island, Edmonton, Strathmore and the Peace River region.

The extension activities of AHRC personnel support and complement the extension services provided by other Alberta Agriculture staff centered in regional and district offices. Contact with both commercial and amateur horticulture clients is assured by maintaining a close working relationship with the industry, input into advisory committee recommendations, and involvement with grower groups and associations. As part of an ongoing extension program, staff conduct, teach and participate in numerous short courses and seminars held at various locations throughout the province. To ensure rapid exchange of information between the producer and the researcher, staff host commodity oriented field days at AHRC and participate in similar field days held elsewhere. As well, membership and active involvement in commodity advisory groups, Agriculture Canada expert committees, and industry-based committees permit the dissemination of applied research information to all sectors of the horticulture industry.

III. PROGRAM ACTIVITIES

A detailed discussion of the activities undertaken by the branches to carry out their programs is presented in this section.

A. FIELD CROPS BRANCH

a) CEREAL CROPS

With the co-operation of District Agriculturists and the Regional Crop Production Specialist, surveys of top producers were conducted in Region 1 on Hard Red Spring Wheat, Irrigated Soft White Spring Wheat, and Winter Wheat production. This information is being analysed and will be compiled into three reports for extension work next fall and winter. Already demands for this information have resulted in five producer meetings this past winter.

A major extension effort was placed on barley production techniques. Producer survey information and the latest research results were used in this effort. Speaking requests came from industry, commodity groups, district and regional staff. Additional production information was supplied to farmers via radio, television and press releases.

The publication "Varieties of Cereals and Oilseed Crops for Alberta" was revised, updated and distributed through the "Country Guide" and District offices.

The publication "Barley Production in Alberta" was revised and reprinted.

Seventy-seven Municipal Co-operative Seed Cleaning Plants processed 28.9 million bushels of cereal grain and oilseeds for the year ending June 30, 1983. This amount was down 2.2 million bushels from last year. Nevertheless, this year was the second highest on record. The following table shows the amount of seed processed in 1983.

General Summary (Bushels)	1983
Total cleaned for Commercial Seed	24,263,671
Total cleaned for Pedigreed Seed	1,163,924
TOTAL CLEANED FOR SEED	25,427,595
Total cleaned for Dockage Removal	3,428,444
TOTAL PROCESSED	28,856,039
Average grain processed per Plant	374,754

The Upgrading Program grant applications remained about the same as last year. Forty-four applications were processed, totalling $1,546,774.59 of expenditures by the plants, and $668,592.58 of Provincial grant money in the 1983/84 fiscal year. This compares to 45 grant applications totalling $1,876,355.60 of expenditures and $861,898.64 of Provincial grant money last year. The average grant paid in 1983 was $15,195.29, compared to $19,153.30 paid last year.

A new Co-op Seed Plant, costing about $900,000.00, was completed at Rosebud. High Level converted the remains of a portable seed plant into a workable stationary plant for approximately $250,000.00. Four other plants are in various stages of replacement; three of these will likely be completed by next fall. These plants will cost about $1,000,000.00 each. Our Provincial Replacement Program provides technical and financial assistance to these plants.

b) OILSEED CROPS

Canola acreage in 1983 increased considerably to 2.5 million acres from 1.85 million acres in 1982, and 1.55 million in 1981. Dry spring conditions in northeastern and northwestern Alberta resulted in poor stand establishment where growers inadvertently dried out the seedbed. Heavy June and July rains throughout the Peace River Region and a large area around Edmonton through to Hardisty resulted in crop losses through oxygen deficiencies from flooding and saturated soil.

The larger acreage coupled with weather damage resulted in a lower Alberta average yield of 19.6 bushels per acre in 1983, compared to 22.6 bushels per acre in 1982.

Principal activities were directed towards technology transfer through media releases, training sessions with crusher and other industry field representatives, field tours, media presentations, production meetings and individual contacts. A major extension program utilizing the canola production survey results combined with research information was presented to thirty-one production meetings. Numerous articles and materials were prepared and assembled for regional and district staff, educational institutes, and commodity groups.

A "Canola Production Package" was prepared for the Canola Council of Canada for their "Grow with Canola" technology transfer program. This major publication incorporates the latest technology from researchers together with practices from top growers to provide an integrated management package for maximizing canola production on a per acre basis. The Canola Production Manual will be made available to growers throughout western Canada and Ontario, and will be distributed by the Canola Council with the help of the department field staff.

Close liaison was maintained with oilseed organizations, crushers and exporters so as to provide resource information and to help facilitate communications within those industries. Two Alberta Canola Industry meetings were held to discuss the common concerns of the canola industry by crushers, grain handlers, producers, seed growers and government. Assistance was provided for the initiation and development of a Flax Council of Canada with the Flax Growers of Western Canada.

Close liaison was maintained with Agriculture Canada regarding the Canada/Alberta Canola Breeding project at Beaverlodge, Lethbridge and Saskatoon. This project has completed its first year with good progress towards the development of varieties for northern Alberta and for southern Alberta irrigation and dryland.

c) SEED TECHNOLOGY

The Alberta Branch of the Canadian Seed Growers' Association experienced its most successful year to date. Approximately 1,100 growers accounted for over 195,000 acres (78,000 hectares).

The Alberta Stock Seed Distribution Committee handled roughly 50 applications for Breeder seed and Probationary Status.

SeCan Association is now handling most of the new varieties and so they are receiving most of the applications for Breeder seed direct to their office. SeCan's membership has grown to over 2,000 and SeCan varieties accounted for 46% of the inspected acreage. Two regional SeCan meetings were held in Alberta; one at Grande Prairie on March 15th, and one at Red Deer on March 16th.

A new Pedigreed Seed Show was held in Edmonton. The show was very successful receiving over 200 pedigreed entries the first year. As well, the display was present at Ag-Expo in Lethbridge, Round-Up in Calgary and various smaller fairs throughout the province. The Field Crops Branch provided assistance to people entering samples in the Royal Winter Fair in Toronto.

The Alberta Branch of the Canadian Seed Growers' Association again hosted their major Probationary/Select Workshop in Lacombe and held a number of field and information days.

The Seed Technology Workshop, held at Olds College, was again well received. The various representatives of the seed industry are very supportive of this event.

The Alberta Branch of the Canadian Seed Growers' Association maintained liaison with the respective commodity groups and associations. Edmonton was the home of the 1984 Annual Meeting which attracted 180 members and guests. The Alberta Branch also participated in the National Canadian Seed Growers' Association Convention, and the

Canadian Seed Growers' Association/Canadian Seed Trade Association Interprovincial Meeting.

The Canadian Forage Seed Project handled 177 applications for 23,187 kg of Foundation seed. This was distributed to individual seed growers as requested. In addition, 28,838 kg of Foundation seed was demoted to Certified and released to the successful tender. Most of this was channeled through the Seed Trade.

Assistance was provided to all regional and district staff as requested. This assistance was also made available to commodity groups, associations, Agriculture Canada Research Stations, universities, colleges, and the farming public.

d) FORAGES AND SPECIAL CROPS

(i) Forages

The Forage Section continued the improved extension program with special emphasis on pasture management and pasture improvement by working through forage associations. The 1983 forage seed sales were generally higher than last year with clover seed sales reaching record levels due to sales to the United States.

Drought conditions in the spring of 1983 in northeastern, northwestern and the Peace River area of Alberta, curtailed forage production resulting in severely over-grazed pastures and a 50% or more reduction in first cut hay fields. The use of annual forages for early grazing and the July rains improved the forage picture so that emergency feed requests were at a minimum. A mild winter and an early spring reduced feed requirements resulting in some carry over of conserved feed.

Seven forage associations continued their demonstrations on rotational grazing of pastures which are proving that more pounds of beef per acre are a reality. Implementation of these management practices are now being accepted and utilized by many producers. A

specialized type of rotational grazing called the Savory Grazing Method has been introduced to Alberta and the results of these trials are being monitored by the Forage Section for the practicability of the method.

This section co-ordinated the testing of Chinese seed for adaptation in Alberta and was involved in hosting a number of foreign delegation. This section also participated in foreign missions to China, Eastern Europe and Scandinavia.

Pasture demonstrations and meetings were the main emphasis of this Section. There are now 25 rotational pasture projects within the agricultural regions of Alberta.

The development of methods for the preservation of high moisture hay was emphasized and numerous trials conducted.

A pasture management film and slide kits of species of forages were developed for extension purposes within the regions.

Liaison with the dehy industry, seed trade, universities and Agriculture Canada to promote and develop the forage industry was maintained.

The Forage Section has participated in the initiation of a National Forage Council and the development of a Forage Seed Crop Insurance Program.

Numerous press, radio and pamphlet releases were prepared on different phases of forage production.

ii) Special Crops

The Special Crops Section initiated and assisted in carrying out special crops programs for Alberta farmers. The method of action was by co-operation in extension programs with regional and district staff, educational institutions and agri-business, by initiating research programs, and by assisting in demonstration plot work in Alberta.

Total special crop acreage remained the same in 1983 when compared to 1982. Interest in pulse crops increased and was reflected by an increase in the dry pea acreage. Fababean acreage remained the same whereas the lentil acreage decreased in 1983 when compared to 1982. Grain corn, confection sunflower and buckwheat acreages increased in 1983. Canary seed acreage decreased as a result of a price softening of this grain.

This section was also involved in assisting various associations and organizations in initiating work on projects with wild rice, comfrey and Jerusalem artichokes. The section also continued its assistance with alfalfa and leafcutter production and continued the fiber flax project during 1983.

e) CROPS RESEARCH

Last year marked the tenth anniversary of the beginning of the Feed Grain Breeding Program in Alberta. To celebrate this, we held our first public field day in conjunction with the Federal Research Station in Lacombe. This was a very successful day with an estimated 600 or more visitors taking part in our two tours.

In addition, staff took part in five other field days and over twelve production seminars representing more than 2,000 producers and agri-industry people.

After ten years, our primary objective remains the production of newly adapted, high yielding varieties. Both Empress and Abee, released from this program in 1982, have found favor with the producer with the result that all available seed was sold out in February for the 1984 production year. In addition, we have entered five winter wheats, five winter triticales, two spring barley and one spring triticale, with excellent silage production potential, into co-operative trials for the first time this year. These join the three barley and two spring triticales already in the test leaving open the option of licensing up

to three new varieties in 1985.

We are confident that in the next 10 years we will see a large part of Alberta's cereal production and livestock feed utilization in varieties produced by this program.

We spent considerable time in 1983 identifying special purpose barleys with high energy and high protein quality. These lines will be further tested in 1984 with entry into co-operative and nutritional testing to begin the year after.

The winter wheat and winter triticale breeding programs are showing great potential in central Alberta with acceptable winter hardiness and disease resistance as well as yield. This has demanded an increase in the testing of advanced lines, therefore, a third test location was planted at Trochu in central Alberta in addition to the regular sites at Lacombe and Olds. In addition, we have arranged to gain more data through the Lethbridge Research Station by exchanging nurseries. We are now confident that we can produce hardy, disease resistant, strong strawed and high yielding varieties of both winter wheat and winter triticales that will be adapted to production in central Alberta.

Significant gains have been made in the area of spring triticale in identifying lines with reasonable sprouting resistance and good seed quality. These are important discoveries if triticale is to become an economical crop in Alberta. Additional gains have been made in the areas of early maturity and annual forage production with triticale lines. In 1984, a concerted, co-operative effort is to be made to include forage production as part of the advanced co-operative testing system with Alberta Agriculture's research team taking the leadership role. This decision will allow Alberta's livestock producers the opportunity to increase their silage yields 30% to 50% within the next 5 years. Much of this work was funded by Farming For The Future allowing us to expand our efforts in triticale production and breeding. It is evident to even the untrained eye that this additional support has been extremely beneficial. In this regard, we invited Dr. B. Skovmand,

Head of the International Triticale Program at CIMMYT in Mexico, to visit during the production year. Dr. Skovmand spent considerable time with our scientists and technical staff, giving freely of his experience and knowledge. Through this exchange we have been able to gain access to germplasm in at least one new important triticale program.

The Cereal and Oilseed Testing Program which was funded by Farming For The Future over the last five years and supervised by A.A.C.R., was again very successfully carried out through all co-operative research agencies in the province. We have now accumulated on all spring sown cereal and oilseed crops a sizeable data base which has found widespread use with the Department's Extension Branch, the seed industry and producers alike. The information has allowed the Department to respond to producers inquiries with more accurate and precise information. With the license of more specifically adapted and special purpose varieties in the last few years thereby setting the trend for the future, this testing program is sure to become one of the most important services the Department of Agriculture offers.

We are pleased with our 1983 program year and are looking forward to the 1984 season with great expectation.

B. CROP PROTECTION BRANCH

a) CROP INSECTS

i) Grasshoppers

The warm dry spring provided good conditions for egg hatch and nymph development throughout the Province. However, late June rains allowed crops to outgrow much of the damage and control operations were less than anticipated.

Cereals were protected by treating the edges of fields as grasshoppers moved into crops from roadsides and pastures. However, large scale spraying of fall seeded crops occurred south of Calgary and in east central Alberta near the Saskatchewan border.

The following estimates of acreages sprayed to control grasshoppers were obtained from field staff:

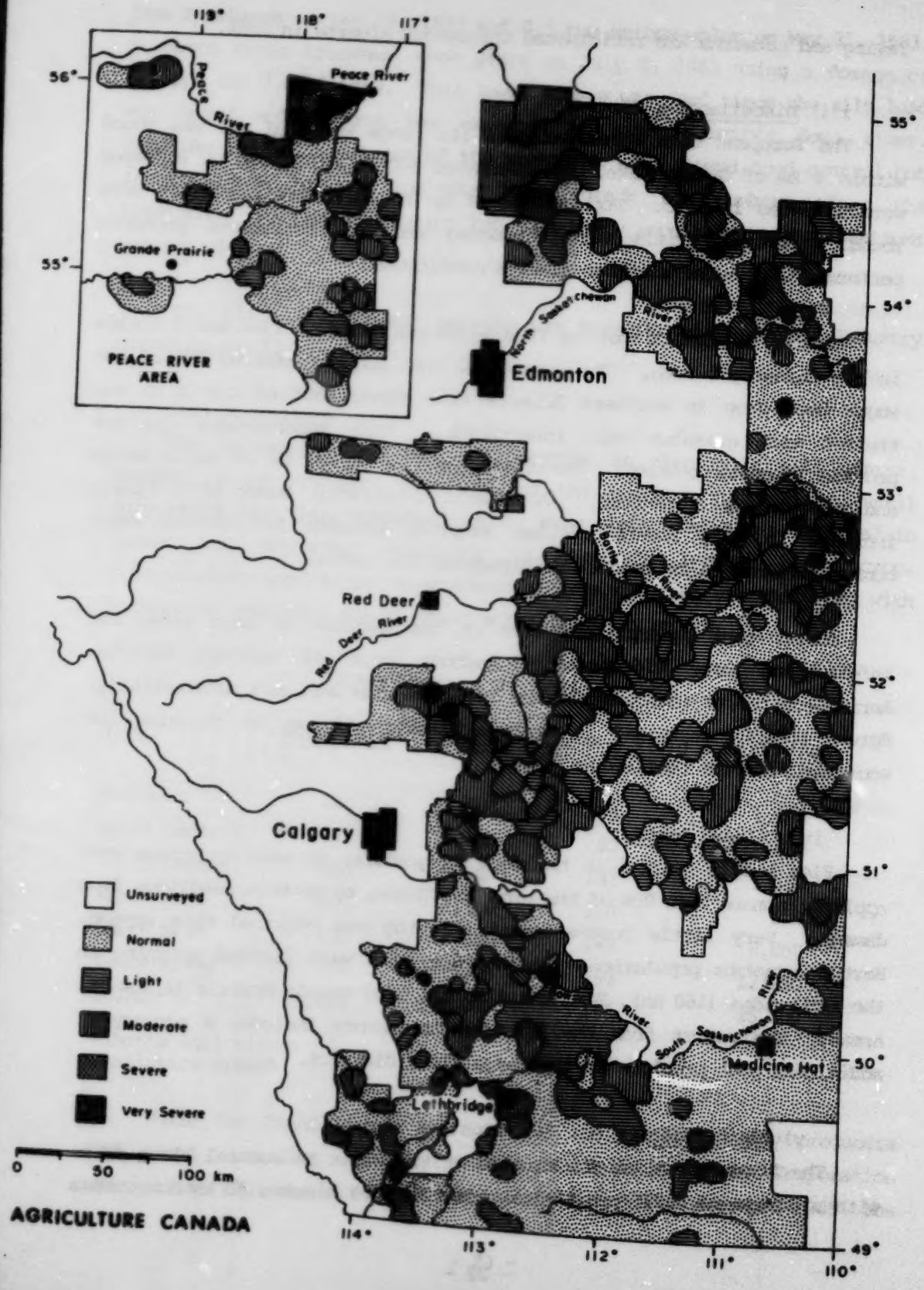
Fairview/Fort Vermilion	1,000 ha
Slave Lake/Westlock	1,620 ha
Barrhead area	2,200 ha
Lac Ste. Anne	650 ha
County of Vermilion River	9,300 ha
County of Wainwright	4,000 ha
Southern Alberta (Co.'s Willow Creek, Vulcan, Warner)	12,200 ha

The warm long fall allowed for good egg laying and severe grasshopper infestations are anticipated in 1984. The 1983 grasshopper forecast map is attached.

ii) Cutworms

With the dry spring came a moderate to severe infestations of cutworms throughout the province. Fortunately, late June rains in most of central, northern and the Peace District terminated the problem. An estimated 3,000 hectares in the Vermilion River/Edmonton area, 4,000 hectares in the M.D. of Starland and County of Three Hills, and 4,000 hectares in the County of Willow Creek and M.D. of Taber were treated to control cutworms. The long open fall allowed for good egg

1983 GRASSHOPPER FORECAST MAP



laying and cutworms are anticipated throughout Alberta in 1984.

iii) Miscellaneous Pests

The European Corn Borer extended its range westward and was found within 4 km of Grassy Lake. An estimated 500 ha of 24,000 ha surveyed were infested in 1983. Populations of up to 25 borers per stalk were found. Control trials were conducted and all registered products performed well under southern Alberta conditions.

Hessian fly damage ranging from 5-30% was found in five wheat fields in the Wainwright area. The sugar beet root maggot infested 70% of the sugar beet crop in southern Alberta even though 80% of the crop was treated with granular soil insecticide. Many insecticides did not provide adequate control. Temik was used on 2,500 ha of sugar beets and provided good control. Acreage treated with Temik will likely increase in 1984 and a residue sampling program for ground water contamination will be conducted throughout the season.

Forest tent caterpillars were on the decline in most areas but infestations were widespread throughout most of central Alberta. Aerial control of this pest in the Edmonton area declined substantially. Spruce budworm increased in central Alberta and may be reaching the economic level in 1984.

iv) Oilseed Pests

Flea beetle control in the form of granular or seed dressings were applied to more than 90% of the crop in Alberta to protect seedlings from damage. Very little post-emergent spraying was required this season. Bertha armyworm populations remained low with very limited spraying in the Lethbridge (160 ha), Edmonton (120 ha), and Grande Prairie (1,200 ha) areas. The report from the Fairview Laboratory includes a summary of additional pest problems in the Peace River district.

v) Black Flies

The Athabasca River was treated at two sites to control black flies with a dosage of 0.275 ppm methoxychlor for 7.5 minutes 80 km downstream

from Athabasca on May 30, 1983 and 0.3 ppm methoxychlor on May 31, 1983. A second river treatment took place on July 5, 1983 using a dosage of 0.2 ppm for 7.5 minutes. This lower dosage was used since the silt load was heavy and control was expected to extend further down river. Sampling 160 km downstream of the treatment site showed good control but reports from farmers indicate heavy black fly numbers after the treatment. No firm conclusion for this heavy population after treatment was possible.

The black fly control program was transferred to Animal Industry effective April 1, 1984.

vi) Apiculture

The spring of 1983 was cool despite an abnormally mild winter. Weather in the northern two-thirds of the province remained dry until July which was then extremely wet. Warm sunny conditions returned in August and September resulting in Alberta's largest honey crop. Unfortunately conditions in southern Alberta remained extremely dry with beekeepers reporting one of their worst crops on record.

Alberta Honey Production - 1983

Area	Beekeepers	Colonies	Average Yield lbs/colony	Total Production '000 lbs
Southern	130	25,000	68	1,700
South Central	245	11,500	83	950
North Central	220	9,600	141	1,350
North East	200	7,100	120	850
North West	630	57,000	140	8,000
Peace River	185	61,800	198	12,250
TOTAL	1,610	172,000	146	25,100

Alberta Agriculture
Statistics Branch

While the Peace Region averaged 198 lbs per hive, many producers had crops exceeding 300 lbs. Alberta Hail and Crop Corporation statistics indicate their clients in the Peace averaged 225 lbs

for 50,000 insured hives. Good crops in Saskatchewan and to a lesser extent in Manitoba put Canada's honey production in excess of 85 million pounds — well above average.

Approximately 65,000 hives were wintered in the fall of 1983, a significant increase over the previous year. Statistics indicate that 67% of Alberta's beekeepers now winter a proportion of their hives. Factors influencing this trend are the rising costs of package bees, the Canada/U.S. exchange rate, the poor condition of package bees the previous spring and the increasing success of wintering among Alberta's beekeepers. Initial indications are that wintered hives are in good condition in 1984 with losses projected at approximately 6% among commercial beekeepers.

Seven apiary fieldmen were employed during the summer of 1983 for the control of bee diseases. While American foulbrood continued to be a problem for the industry, most commercial beekeepers continued to improve their disease management.

Responding to the high rate of queen failure in package bees, a survey of Nosema disease was undertaken in early May, 1983 in the Peace region. Results indicated high levels of Nosema disease in most of the 138 samples analyzed indicating a possible reason for queen failure. A number of rejected queens were checked for sperm in the spermatheca and all were positive, indicating that queens had mated. The poor condition of the 1983 package bees was a result of rain and flooding in California during March and April.

In conjunction with other provinces, a survey was conducted to determine if Acarine disease (Acarapis woodi) was present in Canada. Eighty-one samples were collected and analysed all of which proved negative.

The major extension thrust continues to focus on the promotion of self sufficiency within the beekeeping industry. Field days were held at Brooks on three occasions, Beaverlodge, Fairview College and

Spruce Grove in conjunction with ARHC, CDA and the Alberta Beekeepar's Association. A queen rearing course was held at Fairview College.

Extension literature was prepared on various management techniques. The apiculture newsletter was distributed 3 times.

Three Farming For The Future on-farm demonstration projects were undertaken in co-operation with producers. The use of propane bird-scare cannons proved effective in repelling bears from apiary sites, however the cannons required considerable maintenance. This method would prove feasible if maintenance-free cannons could be procured. The seeding of canola throughout the season for a prolonged bee forage period indicated potential, although increased levels of fertilizer are required. This project will be repeated. The utilization of Alberta-produced queens in conjunction with indoors overwintering proved highly successful and this demonstration will be repeated in 1984/85.

The testing of a light weight electric bear fence continued to prove effective. A number of beekeepers are now using the fence. A home made insulated polyethylene wintering wrap has been monitored for another year and is proving effective. A fact sheet is in preparation outlining the construction and utilization of the wrap.

A co-operative project with departmental engineers examining the technicalities of wintering indoors has been initiated with the objective of defining parameters and will result in recommendations to the industry upon completion. A prototype of a field hive scale was built by a departmental technician and plans are being prepared for publication. Technical drawings of pollen trap designs were undertaken and are in preparation for publication.

The five year Farming For The Future funding of the Alberta bee breeding project was completed. Stock has been selected which appears to produce and winter well under Alberta's conditions. The breeding stock will continue to be propagated by CDA at Beaverlodge while the Fairview and Olds agricultural colleges will carry out the selection

process and produce queens for distribution to the industry. It is foreseen that eventually producers will take over the production of this stock.

The wholesale price for honey took a significant drop in 1983 to 54¢ per pound from 61¢ the previous year. This may be in part due to the large Canadian crop but also due to the world situation in which Argentina, Mexico and China are increasing their production. Furthermore, with most tropical countries' beekeeping potential virtually untapped, it can be expected that more countries will join the international honey market. As these countries have lower production costs and are in desperate need of foreign currency, the Canadian industry will surely feel increasing pressure in the future. It seems apparent that the Canadian beekeeper will have to increase production while decreasing operating costs per hive in order to maintain their current position. The Canadian Honey Council organized a national promotion program in an attempt to increase Canadian consumption.

Africanized bees, and the parasitic mites, Varroa jacobsoni and Acarapis woodi continue to migrate northward through Central America. The USDA has formulated stringent contingency plans aimed at eradication should the bees or parasites enter the U.S. Agriculture Canada, with input from industry is presently doing likewise. At present migration rates, the Africanized bees should enter the U.S. in the early 1990's, although a number of swarms have been taken from ships in U.S. ports after travelling the Panama canal. The Canadian industry is concerned that the Africanized bees or the mites could enter Canada via the U.S. package bee industry.

b) PLANT DISEASES

A dry, early spring followed by excessive mid-June rains caused considerable crop losses in many central and northern areas of the province. The excellent germination of cereal and oilseeds that occurred in the lower cropland areas in May were drowned out in late June. Higher

land where seed had failed to emerge, greened up in late June leaving many farmers with a two stage emergence of crops and many disease problems.

A section on chemical (fungicidal) control of plant diseases was included in the branch publication "A Guide to Crop Protection in Alberta" for the first time.

i) Cereal Crops

Cereal diseases that were considered of minor importance several years ago are now causing significant economic losses in many areas. Septoria glume blotch of wheat has become widespread in the last few years on all varieties of wheat, and losses of 10-20% in yield have been documented in a number of instances. This fungus has become one of the major disease problems in growing areas of North America. Genetic resistance to the pathogen has not been developed, seed treatments for the seed borne phase are ineffective, and no foliar fungicides are registered in Canada for control of this disease.

In the irrigation regions about half of the acreage is now devoted to growing soft white spring wheat. This precludes a recommended 3 to 4 year rotation for disease control and consequently a build-up of diseases is now occurring. Such diseases as take all, stripe rust, common root rot, powdery mildew and black point are all favoured by "short" rotations or growing wheat after wheat. In addition, only 1 variety of wheat, "Fielder" is recommended for the region thus compounding the problem. However, a temporary license has now been granted for "Owens", a variety with resistance to stripe rust.

Barley diseases were severe in central western regions of the province, particularly scald and net blotch in some localities. Foliar fungicide trials with non-registered products at Westlock showed yield increases of around 25% with one of the chemicals. Yield increases of 10-15 bushels an acre would be needed to justify application. In the same Westlock area an absolute deficiency of copper micronutrient was demonstrated in one barley growing area and a severe outbreak of take

all disease, unusual in barley, caused an estimated 30% yield loss in Johnston barley growing on a sandy loam soil at Neerlandia. Again many growers in central Alberta experienced heavy to late yield losses with Elrose barley due to severe net blotch fungus infection. Growers are now cautioned against growing this variety in central and northern Alberta in the 1984 edition of "Varieties of Cereal and Oilseed Crops for Alberta". A fact sheet on barley diseases in Alberta was published as a "Country Guide" insert.

ii) Oilseed Crops

Seedling blight of canola was light this year with few fields in need of reseeding. Extension work has made farmers aware of the fact that for good seedling emergence and stand the soil has to warm up. A twenty dollar soil temperature probe is a good investment, far better than having to reseed.

Sclerotinia stem rot incidence was considerably down from previous years presumably as a result of the dry spring conditions, resulting in a much lighter canopy in the canola crop. Continuous rain in late June and early July may also have had some influence on fungus spore infectivity. Only 14,000 acres of the crop were sprayed for control of sclerotinia stem rot in 1983 vs. 30,000 in 1982. Alternaria black spot of canola was severe in some north-central areas of Alberta but there were suspicions, confirmed in some instances, that high levels of this disease were correlated with sulphur deficient or low sulphur soils.

iii) Forage Crops

Verticillium wilt of alfalfa continues to be confined to the irrigation regions. The disease is widespread in hay fields and 12 out of 80 new fields surveyed in 1983 were found to be infested. For the first time trace levels of the disease were discovered in a few seed fields. Farmers with land infested with the disease organism are generally following prescribed disease control procedures and consequently the expected level of increase for this disease into new growing areas appears to have slowed down considerably.

Alberta continues to remain free of Dutch Elm Disease and the beetle vectors of this disease.

iv) Bacterial Ring Rot

The BRR control program is operated and administered by the Plant Industry Division. Assisting in the program were seven municipalities funded through department grants. The Alberta Potato Commission continued to co-operate in the program by obtaining planting records and supplying lists of potato growers. The incidence of the disease in 1983 remained well below the previous 4 year average which may be attributed to the continuing use of certified seed by most table stock growers (Table 1). Rhizoctonia and potato wilts were a problem in field inspections. One case of late blight was identified in the Edmonton area but damage was minimal. No BRR was found in pedigreed seed fields and good yields should provide sufficient certified seed stocks to meet demands for 1984 planting requirements with the exception of Norchip stocks required for the processing industry. The volume of Alberta grown seed potatoes exported to the U.S. northwest continues to increase and future prospects look good.

TABLE 1. POTATO ACREAGE AND INCIDENCE OF BRR IN 1983

District	No. of Farms		Acres (Hectares)		% Infested	
	Inspected	Infested	Inspected	Infested	Farms	Acres
Peace River area	10	1	202 (81.8)	7 (2.8)	10.0	3.4
M.D. Sturgeon	15	1	1,588 (643.0)	30 (12.1)	6.7	1.9
County Parkland	3	1	944 (382.2)	6 (2.4)	33.3	0.6
Edmonton area	8	1	258 (104.4)	5 (2.0)	12.5	1.9
Barrhead area	5	1	161 (65.2)	15 (6.1)	20.0	9.3
Vermilion area	12	0	675 (273.3)	0 (0.0)	0.0	0.0
Red Deer area	20	0	686 (277.8)	0 (0.0)	0.0	0.0
Calgary area	15	0	178 (72.1)	0 (0.0)	0.0	0.0

POTATO ACREAGE AND INCIDENCE OF BRR IN 1983 (Continued)

District	No. of Farms Inspected	No. of Farms Infested	Acres (Hectares) Inspected	Acres (Hectares) Infested	% Infested Farms	% Infested Acres
County Newell	19	5	2,480 (1,004.0)	527 (213.3)	26.3	21.2
I.D. #1-2	3	0	70 (28.3)	0 (0.0)	0.0	0.0
M.D. Taber	41	7	10,069 (4,076.5)	895 (362.3)	17.0	8.9
County Forty Mile	10	0	665 (269.2)	0 (0.0)	0.0	0.0
County Lethbridge	10	0	538 (217.8)	0 (0.0)	0.0	0.0
Lethbridge Perimeter	24	2	245	6	8.3	2.4
Totals	195	19	18,759 (7,595.0)	1,491 (603.6)	9.7	7.9
1980-83 Average	196	30.5	17,256 (6,986.2)	1,991 (806.1)	15.5	11.5

Of the 195 potato farms inspected, involving 18,759 acres (7,595 ha), 9.7% of the farms and 7.9% of the acreage were infested with BRR. The 4 year average (1980-83) is 15.5% of the farms and 11.5% of the acreage infested.

v) Regulatory and Policy

The Bacterial Ring Rot Review Board received no appeals in 1983. The seven co-operating municipalities continued to play a major role in the control program and the Alberta Potato Commission co-operated in supplying grower planting records and lists of growers in the province. For the second year BRR trial plots for field observation were carried out at the Alberta Tree Nursery and Horticulture Centre in co-operation with Dr. S. DeBoer, Agriculture Canada Research Station, Vancouver, British Columbia. Nineteen cultivars were tested for varietal response and latent infection of BRR. Results of the 1983 trials indicated that some varieties inoculated at low levels in 1982 carried a latent infection into the following year with tuber and stem symptoms, but no visible foliage indications of the disease. This presents a major problem in field inspections of potato stocks carrying a trace latent infection of BRR. These trials will continue in 1984.

The incidence of the disease in the 7.9% infected acreage (down from the 1980-83 average of 11.5%) continues to be, in most cases, a trace occurrence in the commercial potato crops inspected with very little economic loss to the growers. Continued use of pedigreed seed stocks by commercial growers and a good sanitation program should keep the disease at minimum levels with the aim of eradication of BRR in the future. Alberta continued to be free of BRR in the 2,700 acres (1,093 ha) of pedigreed seed inspected by Agriculture Canada in 1983. A uniform policy for the seed potato industry across Canada is close to being put in place after a year of on-going talks between federal, provincial and potato industry representatives.

REGIONAL LABORATORIES

i) Fairview

The regional crops laboratory provided a diagnostic, survey and extension service for Region 6 in entomology and plant pathology. A total of 543 specimens were processed (see Table below).

TABLE

SUMMARY OF SPECIMENS SUBMITTED TO THE REGIONAL CROPS LABORATORY - FAIRVIEW
April 1, 1983 to March 30, 1984

Crop	# Disease Specimens	# Insect Specimens
Field Crops	145	41
Ornamentals	130	40
Shelterbelts	4	1
Vegetables	51	5
Fruit	28	4
Miscellaneous	19	74
	377	166

Grasshoppers and clover cutworms were initially found in very high numbers throughout the Peace, however, heavy rains and cool conditions reduced numbers to non-economic levels. Three hundred acres were sprayed for grasshoppers in Fairview, and 500 acres were sprayed for clover cutworms in Fort Vermilion. Bertha armyworm infested late-maturing

canola crops in Grande Prairie, Beaverlodge and Sexsmith. Three thousand acres were sprayed for this pest.

Ten alfalfa and 90 canola fields were surveyed for lygus bugs. Damage to canola was estimated to be 8.2, 2.1 and 1.8% in the south, central and northern parts of the province, respectively. Drought appears to promote heavier damage, while wet conditions promote higher lygus populations. Trials were set up to test chemical insecticides for control of lygus in alfalfa and canola, flea beetles in canola, and thrips in barley. All 20 chemicals applied to alfalfa gave significant control of lygus. Both Lannate L and Lannate LV significantly reduced populations of lygus, when applied at the early pod stage of canola. Decis proved to be the most effective of 209 chemicals tested, in reducing numbers of thrips in barley; some repellency is suspected. Vitavax RS and Vitavax RS + Prill-On gave significant control of flea beetles in canola, but resulted in no yield increase.

Snow molds, primarily Myriosclerotinia borealis and Plenodomus sp., caused severe damage in 1983 in the small acreage planted to fall rye and winter wheat. Brown root rot (P. meliloti) was widespread in alfalfa and red clover, resulting in poor regrowth in the spring. A survey was made of 123 barley fields; the worst problems were common root rot, scald and net blotch, resulting in mean yield losses estimated at 9.3, 6.5 and 2.2%, respectively. In some fields, yield losses to scald and net blotch were between 20 and 30%. Sixty canola fields were surveyed late in the season. Root rot, foot rot and Alternaria blackspot were the most prevalent diseases in canola in 1983, while sclerotinia stem rot and staghead caused serious yield losses in a few fields. Glume blotch, caused by Septoria nodorum, was common in spring wheat, and occasionally caused significant yield loss. Benlate gave good control of glume blotch and increased yield by 20% in one field trial. Ergot was unusually prevalent in wheat and barley, as was head melanosis in Park wheat. Take-all, previously unknown in this region, was found at low levels in a few fields of wheat. Seed treatments were tested for the control of true loose smut, common root rot, lodging and net blotch on barley; and seedling disease in canola. A number of demonstration plots were set up

for barley, glume blotch control in wheat, sclerotinia stem root control in canola, and snow mold control in winter wheat, with the co-operation of growers throughout the region.

ii) Olds

This laboratory provided a diagnostic, survey and extension service on plant diseases, insects and weeds for Region II and the Western half of Region III. The lab also operated the Alberta Seed Potato Program, providing seed potato producers with their basic seed stocks and also providing growers with extension and field inspection services.

This Laboratory is primarily a back-up service to District Agriculturists, Agricultural Fieldmen and other extension agents. In this capacity, 431 diseases, 275 insects and 131 weeds were processed. The main problems were: winter injury, chemical injury, root rot, cereal leaf diseases, thrips, aphids, leaf miners, toadflax and scentless chamomile.

The Alberta Seed Potato Program supplied most Alberta seed potato growers with 23,515 pre-elite seed potato tubers. In addition, two acres of mother stock seed potatoes were grown and tested for disease to assure freedom from diseases. These stocks will be distributed to seed growers in 1984.

Alberta seed potato growers produced 2,400 acres (971 hectares) of seed potatoes with a total yield of 26,400 tons (24,000 tonnes) of which 6,393 tons (5,812 tonnes) were sold to U.S.A. growers, and 1,024 tons (930 tonnes) were sold to Manitoba growers, resulting in 28% of our production being exported. Sales to the U.S.A. are up by 82% over 1982. For the first time, substantial sales, 570 tons (520 tonnes) were sold to Oregon growers.

Seed potato plantings in 1984 are expected to be over 3,000 acres. This will result in increased seed exports in 1985.

c) WEED CONTROL AND HERBICIDES

i) Weed Control

The growing conditions in 1983 were not conducive to good overall weed control in the province. The drought conditions in some areas followed by excessive moisture in others did not allow for timely weed control in many instances. This was reflected in the reduction in herbicide sales and the increased visibility of perennial weeds such as Canada thistle in cropland.

There has been a substantial increase in the enforcement of the Weed Control Act. As money gets tighter, landowners are becoming less tolerant of neighbouring weeds that can potentially affect them. Both private landowner and municipalities are turning to the Weed Control Act to provide some relief. This has inspired more co-operative action to alleviate weed problems.

Training and extension activities continued to provide field staff with the updated technical information required to maintain a high level of expertise. Courses were offered in the latest weed control techniques, brush control, administration of the Weed Control Act and sprayer calibration. In addition, active participation in regional and district extension areas, ASB meetings and specialized training schools reached more than 2,000 producers.

Three major Weed Fairs were held in conjunction with the Canadian Agricultural Chemicals Association at Grande Prairie, Camrose and Red Deer with total attendance of over 1,400 people. In addition, mini-weed fairs were locally organized and operated in some regions. The active organizational involvement by local industry in weed fair type of programs, as was the case with a group of aerial applicators, show much promise for future success.

Herbicide application technology is undergoing a major change. The micro-chip technology used in sprayer monitor for several years has been refined to include monitor on each spray tip; application devices

which claim to provide the same degree of control with lower volumes and lower herbicide rates; injector systems which eliminate the need of pre-mixing the herbicide concentrates with water and the use of vegetable oils rather than water as carriers are all recent developments. Activities are ongoing to ensure the effective incorporation of this technology.

The weed control recommendation computer program was designed to aid in herbicide selection by matching crop, variety, weeds and their respective leaf stages to potential herbicides. In addition, costs, availability, imperial/metric conversion and quantity of product required for a given spray tank to provide a specific rate can be made available if required. Demonstrations at the weed fairs indicated that public response to this program would be high. Field implementation is limited by the availability of appropriate equipment in the district and regional offices.

ii) Communications and Special Projects

The 1984 herbicide recommendations publication was revised and expanded to include insecticides and fungicides and was titled "Guide to Crop Protection in Alberta - Part I - Chemical". To facilitate the incomplete conversion to metric units by some users, the chemical rates were expressed in both the volume/acre and volume/hectare form. Twenty thousand copies were printed and distributed. The loose leaf expanded version of this manual, for staff use only, was updated on a continuing basis.

Requests for copies of "Weeds of Alberta" continued to be received from around the world. Arrangements were completed with the Provincial Museum to handle out-of-province requests on a cost recovery basis.

Seven Country Guide inserts were scheduled and produced by the Plant Industry Division during 1983 covering diverse topics such as perennial weed control, safe use of pesticides and common barley diseases.

The roadside brush control program which involves cutting brush first and then treating the first season regrowth is gradually being accepted by municipalities across the province. This method reduces brown-out and the resultant confrontation with anti-spray groups. It also reduces off-target injury to desirable plants and the final, total kill is improved.

A standard approach was developed and implemented to ensure that the railways accept their legal responsibility to maintain their rights-of-way in a reasonably weed free condition. It appears to be having some effect as some lines are currently maintaining their property to the equivalent standard of adjacent landowners.

Work was started on the problem of weed control along drainage ditches. While some of the existing structures will require remedial spraying activities, steps are currently being taken to encourage initial construction that would facilitate more competitive and mechanical controls rather than the use of herbicides.

iii) Urban and Industrial Vegetation Management

Vegetation management programs were delivered to towns, villages, utility companies and highways. A greater degree of enforcement of the Weed Control Act occurred in both urban and industrial areas. Some grants were provided to assist in the initiation of new programs.

The knapweed eradication program continued in Regions 1 and 2. All municipalities actively participated in the program and all known infestations were treated. Several infestations have been eliminated and the ultimate goal is still the complete eradication of diffuse and spotted knapweed before they become established in Alberta. Five Knapweed Highway Alert signs were installed at Montana and British Columbia border crossings to alert travellers that knapweeds are not welcome in Alberta and the vehicles and contents should be checked for propagules.

Eradication measures on nodding thistle within the City of Calgary

continued through chemical treatments and hand pulling. No plants have been found at earlier sites in Drumheller and Strathmore. All sites of previous infestation will be monitored to ensure there is no regrowth.

iv) Weed Research and Development

The Weed Control Trial and Demonstration Opportunities program continued as in the past years. Plots were established across the province in conjunction with the agricultural service boards. Thirty-one service boards participated in a total of 65 established sites. Other research trials were established including 4 small plot experiments investigating tall buttercup control in native and seeded pasture, 2 small plot experiments on knotweed control in wheat and summerfallow, 8 non-replicated trials on Roadside Vegetation Control and one small plot experiment on blueweed control in pasture. The information obtained from these research trials is used in generating scientific reports as well as supplying the surrounding area with appropriate weed control practices.

The Weed Alert program continued to gather information submitted by field staff. The 1983 submissions were added to the new computer system developed to trace the distribution and density of various weeds at the municipal and provincial levels. The new Weed Alert program can produce maps and reports from the information submitted. Weed Alert records are useful in determining research priorities and the need for specific control program. This program also provides a record keeping system which provide continuity of information to offset some of the negative effects of rapid staff turnover. The mapping component of this program is being utilized to accommodate other mapping needs within and outside the Plant Industry Division.

d) PESTICIDE ISSUES

The Pesticide Issues Co-ordinator position was created in 1982 to present a balanced viewpoint on pesticide controversies to the news media; to resolve pesticide issues that arise within the province; to

develop courses for education of farmers, departmental staff, students, and the public about pesticides; and to maintain an awareness of the activities of government and environmental interest groups in the area of pesticides.

Over the past year, a number of pesticide issues and controversies were addressed. Some of these arose within as well as outside the province. Most notable of the provincial issues were poisoned individuals in a floral shop in Red Deer, the concerns of the residents of Barrhead about the disaster that a fire in the chemical storage warehouse would cause, the health consequences of diquat in drinking water, and the concerns of the agricultural service board of Lac St. Anne about aerial use of pesticides in agriculture. Many agricultural service boards are getting concerned about pesticide use in general and this issue will be addressed in the coming year.

Most of the issues and controversies dealt with arose either in the other provinces, or within the federal governments of Canada and the United States. These are the issues that tend to make newspaper headlines and to provide support to pressure groups that would like to see pesticides banned from agriculture. Some of these issues were ethylene dibromide in flour products, the Industrial Bio-Test scandal, the carcinogenicity of baygon, the Nova Scotia herbicide trial, agent orange, etc. Several press-releases and magazine articles were written, and many radio interviews were given by the Pesticide Issues Co-ordinator to allow for a balanced coverage of these issues by the media in this province.

Guidelines for handling major pesticide incidents in the province are being drawn up. Some of these incidents would be fires in elevators where pesticides are stored, or poisoning of school children after a school yard has been sprayed. These major incidents tend to be overdramatized by the news media and must be brought under control very quickly before the media has a chance to exploit the situation.

Several articles were written by the Pesticide Issues Co-ordinator

for magazines and newsletters such as Country Guide, Farm Light and Power, Plough Share, Alberta Medical Association Newsletter, Science Teachers newsletter, etc. These articles were mainly informational in nature and were aimed at the general public or at a particular professional group.

The Pesticide Issues Co-ordinator presented several seminars on pesticides to District Agriculturists, Agricultural Fieldmen, aerial applicators, students in plant science and toxicology at the University of Alberta, medical students, and occupational health physicians. These seminars were intended to inform the participants about current developments in the pesticide area, health hazards from pesticide use, regulations controlling pesticide use, and diagnosis and treatment of pesticide poisoning. The overall aim of these seminars was to inform as many key people as possible about the positive aspects of pesticides.

Several seminars to farmers on pesticide safety were organized and presented by the Pesticide Issues Co-ordinator. These seminars were held in eleven towns and villages in the province and the attendance was over 1,000 farmers. Some of the seminars were also organized by the Women's Institutes, the Women of Unifarm, and district home economists from Alberta Agriculture. The result was that more and more farmers' wives were attending the pesticide safety seminars.

A survey on the health hazards of pesticides to farmers was conducted during the summer of 1983. Several areas were identified by the survey where more work and emphasis are needed. These are the wearing of proper clothing and equipment during pesticide use; poisoning from treated seed; poisoning from insecticides; interpretation of safety information from pesticide label. Future seminars on pesticide safety will address these areas.

Plans for action in the coming year include the preparation of lesson plans on pesticides to be used by the Department of Education for grade 7 ecology classes. A film entitled "Pest Wars" and a tabloid entitled "The Pesticide Gazette" have already been prepared to complement

the lesson plans. The Pesticide Issues Co-ordinator will also present two seminars on pesticides to the Alberta Science teachers convention and to suggest the adoption of the pesticide lesson plans.

A course entitled "Pesticides and Human Health" will be presented to the regional secretarial, clerical and other non-technical staff of the Department. This course is designed to make the department's staff somewhat knowledgeable about pesticides.

A number of pesticide issues have been identified by the regions. The Pesticide Issues Co-ordinator will be looking at ways to resolve these before they become major issues. Also, he will be working with Crop Protection supervisors on major pesticide spray programs to inform farmers of the health hazards of pesticides and the hospitals about symptoms and treatment of pesticide poisoning.

A newsletter entitled "Pesticide Issues" has been established by the Pesticide Issues Co-ordinator to inform the Department's staff about major pesticide issues. This newsletter will be published only when a pesticide issue has arisen in the media and when there is a need to let the department's staff know more about it.

e) PROBLEM WILDLIFE

Responsibility for prevention and control of wildlife depredation of crops and livestocks remains with the producer, with assistance from the Municipal A.S.B. and A.S.B. Fieldman.

The Crop Protection Branch, Problem Wildlife Section is responsible for a) supervision and co-ordination of provincial programs, b) extension, c) procurement and distribution of toxicants and control devices, and d) administration and implementation of portions of the Alberta Agriculture Pests Act.

The Problem Wildlife Section is comprised of a provincial

supervisor, three regional supervisors, and four predator specialists. Two predator specialists retired during 1983/84 and will not be replaced because of budget restraints and planned reductions in the size of the civil service.

The Problem Wildlife Section is responsible for the supervision and co-ordination of three major programs: rat control, rabies suppression in skunks, and prevention and control of coyote depredation of livestock and poultry. In addition, the section provides extension services for the prevention and control of crop or livestock damage from field rodents (primarily pocket gophers and Richardson's ground squirrels), and nuisance birds (primarily magpies, blackbirds, sparrows and pigeons).

i) Rat Control

Alberta was kept essentially free of Norway rats for the 33rd consecutive year. Rat control was conducted by the seven rural municipalities along the Alberta/Saskatchewan border in a control zone 30 km wide and 600 km long. A total of 7,716 inspections of farms, grain elevators and other premises were conducted by municipal and provincial pest control officers. Each premise was inspected from 1-3 times during the year. Infestations were eradicated by the co-operative effort of residents and government personnel.

Confirmed rat infestations in the control zone declined from 201 in 1982/83 to 141 in 1983/84 (Table 1). While the rat control program worked well in all municipalities, the efforts of the pest control officers and staff of the M.D. of Provost and County of Vermilion River were particularly noteworthy. The number of infestations in the County of Vermilion River declined for the fourth consecutive year. The pest control officer for the M.D. of Provost was replaced in 1982/83 leaving a total of 146 rat infestations. Through the hard work and co-operation of the new P.C.O. from Provost and other municipal and provincial staff, infestations declined to 86 in 1983/84 and should decline further in 1984/85. When rat control is neglected, two or three years of intensive control is required before the problem is firmly in hand.

Within the interior of Alberta, suspected rat infestations continue to be reported by a concerned public. Most complaints turn out to be muskrats, pocket gophers, woodrats or mice. Regardless, all suspected infestations are investigated promptly by provincial and municipal P.C.O.'s.

TABLE 1. NORWAY RAT CONTROL ON THE ALBERTA/SASKATCHEWAN BORDER - 1983/84

Municipality	Bait Used		Inspection of Premises*	Infestations		
	Dry (kg)	Water Soluble (L)		'81/82	'82/83	'83/84
I.D. 18	351	0	819	5	1	0
Vermilion River	2,097	250	1,612	56	37	33
Wainwright	313	32	532	5	1	8
Provost	2,885	1,729	2,994	21	146	86
Special Areas	1,845	528	487	3	11	13
Acadia Valley	436	1	387	0	0	1
I.D. 1 & 2	1,126	390	885	2	5	0
TOTALS	9,053	2,930	7,716	92	201	141

* Premises were inspected from 1-3 times during the year.

ii) Rabies Vector Control

The program to prevent the spread of rabies in Alberta, primarily in skunks, continued under the direction of the Central Rabies Control Committee.

Depopulation of skunks was conducted in conjunction with the rat control program along the Alberta/Saskatchewan border. Poison baits, traps and shooting were used to remove skunks. No rabid skunks have been taken in the control zone since 1977.

Within the interior, skunks were depopulated in localized areas wherever rabies was found. Rabies has been present in skunks in the counties of Forty Mile and Warner since 1979 and Newell since 1981 (Table 2). Rabies has not been eradicated from these counties even though approximately $320,000 was spent on skunk control during 1980-84. However, skunk control was conducted primarily with traps until summer 1983, when toxicants were used extensively. One may conclude that skunk

populations cannot be suppressed by trapping alone. Population suppression of skunks should be more effective with toxicants.

Elsewhere in the province, 5 km radial depopulations of skunks were conducted as a precautionary measure around three sites where rabid cats were found. Radial depopulations were conducted by staff from the Crop Protection Branch, Fish and Wildlife Division and local municipalities.

The Fish and Wildlife Division continued to handle bat rabies.

TABLE 2. POSITIVE RABIES IN ALBERTA

Year	Skunks			Bats	Other	Total
	Warner/Forty Mile	Newell	Elsewhere			
1979	3	0	10	12	0	25
1980	53	0	1	11	1 cat	66
1981	22	1	0	9	1 dog	33
1982	14	29	0	7	1 horse	52
1983	27	3	2	5	3 cats	40

iii) Coyote Depredation Prevention and Control

For at least the last ten years, Alberta Agriculture's stated objective for the coyote control program was to train producers to resolve their own coyote predation problems with assistance from municipal agriculture fieldmen. Provincial predator specialists were to train agriculture fieldmen and assist with particularly difficult cases. In actuality, few producers were trained; a greater percentage of the cases were handled solely by provincial predator specialists each year. Because of budget restraints, reductions in manpower, and a re-evaluation of the coyote control program, Alberta Agriculture returned to its stated objective in 1983/84; that is, to train producers to resolve their own coyote predation problems. Not all producers could be trained in one year. Thus, predator specialists were directly involved in many cases in 1983/84 (Table 3).

TABLE 3. PROBLEM WILDLIFE COMPLAINTS HANDLED BY PREDATOR SPECIALISTS

Year	Coyote	Wolf	Dog	Fox	Bear	Skunk	Rodents	Birds	Other
1981/82	355	20	41	16	16	93	93	131	12
1982/83	330	19	44	7	12	61	56	61	20
1983/84	313	16	22	0	6	46	15	34	15

While non-lethal preventive measures such as electric fences and guard dogs were promoted, the program relied heavily on the judicial use of toxicants. Human safety was emphasized. In addition, the importance of proper placement of toxicants was stressed to minimize non-target poisoning of wildlife and domestic animals.

Cyanide guns and strychnine baits were the primary toxicants used for coyote control (Table 4). Sodium monofluoroacetate (1080) was also registered for use in toxic collars and in single lethal dose baits in 1984. Although 1080 is not a species-specific poison, members of the dog family have a lower tolerance than birds or other mammals. Thus, use of 1080 in single lethal dose baits should reduce the risk of accidental poisoning of humans and non-target poisoning of wildlife and domestic animals. The toxic collar consists of a rubber bladder filled with 1080 solution which is attached to a collar. Toxic collars are fitted on lambs that are most susceptible to predation. Coyotes most commonly kill lambs by strangulation. When a coyote attacks a lamb that is wearing a toxic collar, the bladder is punctured by the coyote's teeth and the coyote receives a lethal dose of toxin. Thus, the toxic collar is specific to those coyotes that attack sheep, with minimum risk to humans and the environment.

Sixteen 1080 baits were set during the winter of 1983/84, 14 within the M.D. of Cardston and 2 in the M.D. of Foothill. These baits were set to remove coyotes near sheep farms with a history of coyote predation. Cardston is the primary sheep producing area in Alberta.

TABLE 4. TOXICANTS DISTRIBUTED FOR COYOTE CONTROL

Year	Cyanide Shells	Strychnine Units	1080 Baits
1981/82	1672	3632	13
1982/83	1642	3700	13
1983/84	1278	3593	16

iv) Compensation for Bear Damage to Beeyards

Compensation was paid for bear damage in beeyards that were enclosed by a properly constructed, operable electric fence. Compensation did not include loss of production. Compensation totalled $7,413 for 15 claims in 1983.

C. SOILS BRANCH

Introduction

Reorganization within the department occurred during the 1983/84 fiscal year. As a result, some programs and activities were transferred to other sectors. Programs involving agrometeorology, conservation, reclamation and salinity previously within the branch were transferred to the Research and Resource Development Sector. The Regional Soil Specialist transferred to Field Services. A total of seven positions were included.

This reorganization within the department resulted in the need to make some changes within the Soils Branch. The improvement of solonetzic soils and the liming of acid soils, along with non-fallow cropping were amalgamated into a soil management program. Mr. Jerome Lickacz assumed duties January 3, 1984 as Supervisor of Soil Management.

a) AGRICULTURAL LIME FREIGHT ASSISTANCE (ALFA) PROGRAM

The ALFA program provides grants to farmers of 80% of the transportation costs above $5.50 per tonne. During the 1983/84 a total of $601,657.25 in grants were received by 141 applicants [117 farm(ers)] purchasing 21,764.06 tonnes of lime and marl. Table 1 provides information on the program since its inception in 1981.

TABLE 1. Agricultural Lime Freight Assistance Program - Summary

Item	1981/82	1982/83	1983/84
Number of applicants	64	100	141
Total grants	$166,313	$378,787	$601,657
Number of tonnes	$ 4,707	$ 13,211	$ 21,764
Average grant per tonne	$ 34.88	$ 28.67	$ 27.64
Average grant per applicant	$ 2,598	$ 3,780	$ 4,267

A number of changes to the program were introduced June 15th including: revision of assistance for marl separate from that of ground

limestone, revision of a schedule of maximum allowable freight rates, a minimum quality standard for limestone and marl and the need for lime as shown by a lime requirement test report. To encourage use of local supplies of marl, assistance was changed to 50% the highest commercial rate to a maximum equivalent of 100 km. A schedule of maximum freight rates to encourage short hauls was introduced: for hauls up to 200 km, the rate was 11¢/tonne km, 9¢/tonne km for hauls up to 400 km, 7¢/tonne km up to 600 km hauls and 5¢/tonne km for hauls over 600 km. A farm rate was also provided of 70% of maximum commercial rates for the designated distances. The ALFA program was revised to require ag. lime to have a minimum ENV of 70 and marl a minimum ENV of 60. ENV is Effective Neutralizing Value which considers purity (calcium carbonate equivalent) and fineness efficiency. A lime requirement test report was also required along with the application form.

b) SOIL PRODUCTIVITY AND FERTILIZER USE

In keeping with branch objectives, the main activities were extension and applied research related to soil and fertilizer management. Branch staff encountered a high demand for extension meetings and participated in over 60 extension meetings with a total attendance of about 3,500 farmers. Narrow cost/return margins caused increased interest in improving fertilizer use efficiency, particularly related to fertilizer placement, methods of handling and application (i.e. dual banding), cost of materials and rates of application. Alternatives to high input costs such as legume plowdown were being considered and require proper evaluation. Sales activities of non-registered and unproven fertilizer products and soil amendments remained high and was a concern because a considerable amount of money is wasted on these products.

Fertilizer sales in 1982/83 increased marginally compared to 1981/82 (Table 2). The price of nitrogen fertilizer decreased about 10% and phosphate was essentially unchanged as compared to 1981/82.

TABLE 2. FERTILIZER SALES IN ALBERTA
(By Analysis and Nutrient Content in Metric Tonnes)[1]
July 1 - June 30

Fertilizer	1980/81	1981/82	1982/83
82-0-0 (Anhy. Amm.)	158,601	158,894	163,650
34-0-0 (Amm. NO_3)	108,583	90,376	98,658
46-0-0 (Urea)	157,311	161,780	187,226
21-0-0 (Amm. SO_4)	20,943	16,838	19,096
28-0-0 (N. Soln.)	23,041	28,607	28,255
23-23-0	40,647	38,900	---
27-14-0	12,625	12,095	---
Urea Phosphates	10,315	8,638	---
11-48-0 to 11-55-0	254,612	251,058	287,066
18-46-0	659	---	---
16-20-0	19,685	19,602	21,299
10-34-0	1,837	6,496	2,894
0-0-60 (KCl)	22,426	24,687	34,826
Others	17,156	19,593	10,012
Mixed (N/P/K)	10,792	8,239	5,472
TOTAL	859,233	845,803	855,560
Nitrogen (N)	302,154	299,360	303,815
Phosphorus (P_2O_5)	154,623	148,418	152,294
Potassium (K_2O)	14,732	16,244	21,267
Sulphur	---	---	7,842

1 Source: Western Canada Fertilizer Association, Calgary.

Extension, advisory and research activities have concentrated on two main areas of interest and concern, namely soil test recommendations from some private soil testing laboratories and efficiency of fertilizer application methods. There is tremendous variability in the kind and amount of nutrients being recommended by various laboratories. Potassium, sulphur and micronutrients recommendations are a particular concern. Branch staff have been involved in providing extension information and have worked through the Alberta Soils Advisory Committee to develop an accreditation program for soil testing laboratories. Applied research activities on both dryland and irrigated land are directed toward developing soil test calibration data for new crops and varieties and evaluating methods of fertilizer application. Fertilizer input cost were about $300 million in 1983. Increasing the efficiency of fertilizer use by optimizing the rate and method of application can therefore significantly increase net returns from crop production. Current research is identifying differences in the efficiency of

fertilizer use relative to the time, method of application, kind of crop and soil climatic conditions.

i) Research Trials - Irrigated

Applied fertilizer research trials were carried out on most major irrigated crops. Nitrogen and phosphorus fertilizer trials made up most of the research, however, individual trials of potassium, sulfur, zinc and boron were included in most of the plots. The list of 1983 plots are as follows:

Crop	Location
Soft Wheat	Champion
	Coaldale
	Taber
	Taber
	Bow Island
Durum	Burdett
Barley	Coaldale
	Burdett
Alfalfa	Lethbridge
Corn	Bow Island
	Burdett
Peas	Bow Island
	Chin
Beans	Bow Island
	Burdett
Sunflowers	Bow Island
Dryland Barley	Warner

Research work on corn, peas and beans were conducted jointly with Dr. R. Gaudiel of the Alberta Horticultural Research Center at Brooks. Trials were not conducted on irrigated potatoes or sugarbeets. Fertilizer research is presently being conducted by Dr. R.C. McKenzie of the Irrigation Division and Dr. P. Bergan of the Alberta Sugar Company, respectively on these two crops.

All plots had soil moisture monitored on a weekly basis. Generally, response to nitrogen fertilizer was good at most sites. Only about a third of the sites responded to phosphorus fertilizer. Generally, there

was no response to application of potassium, sulfur, zinc or boron. The results of all 1983 work is summarized in the report "1983 Fertilizer Research Plot Summary".

Approximately 16 fall fertilized plot sites were established in October 1983 for the 1984 crop year. Nutrients included in the trials are nitrogen, phosphorus, potassium, sulfur, boron and zinc.

ii) Research Trials - Dryland

A total of 22 research trials were conducted in central and northern Alberta. Seventeen experiments were conducted with potassium fertilizers to determine:

1) optimum rates of application taking into account residual response from previous application,
2) the effect of potassium sources and chloride on diseases of barley,
3) the effect of soil temperature and seeding date on the availability of soil potassium.

Nitrogen and phosphorus placement trials were conducted at three locations. These trials were part of a province wide program to determine optimum methods of fertilizer placement under various soil and climatic conditions (funded by Farming For The Future).

Liming trials were carried out at two locations. One is to evaluate the long term (14th year) effects of lime and the other evaluates liming material including pelletized lime. Two additional trials were established in the fall of 1983 to evaluate liming materials in conjunction with deep ripping. Three liming ripping demonstration trials were also established.

c) SOIL MANAGEMENT

i) Acid Soils

The introduction of the ALFA Program resulted in an increased need for research relating to types, quality and longevity of liming

materials. Three new plot sites were established. Type and quality of lime are being evaluated at two sites. At the third site, lime was applied at various rates to determine if there were any advantages to adjusting the pH beyond the point where all crops can be successfully grown.

A new source of lime was developed at Rocky Mountain House. Griffon Lime Limited is producing a pelleted lime which may eliminate some of the problems encountered while spreading pulverized limestone. Other lime sources are located at Edmonton and Exshaw. There also are numerous deposits of marl located in western and northern Alberta. Contacts have been maintained with potential new lime suppliers.

ii) Solonetzic Soils

Farmer interest in deep plowing (18-30 inches) and particularly deep ripping (15-20 inches) has continued. This has resulted in a continued demand by individual farmers for information regarding their soils suitability for deep tillage. During the 1983 field season, 29 field investigations were completed. Our staff will be monitoring crop responses at two of these locations.

Interest in deep plowing has declined even though responses to plowing usually are greater than ripping. Reasons often cited for this are cost, time involved and plow availability. Many of the solonetzic soils have an acidic topsoil. In these situations, liming must be done in conjunction with ripping. The cost of the combined operations usually approaches the cost of plowing.

Our plans are to expand our work to determine if there are any advantages to multiple rippings.

d) AGRICULTURAL SOIL & FEED TESTING LABORATORY

The Agricultural Soil and Feed Testing Laboratory (A.S.F.T.L.) has four major service areas:

i) Provide an analysis and recommendation service for soils, plants and animal feeds to the general public on a fee basis;

ii) Provide diagnostic and investigational services for Alberta Agriculture on a no-fee basis for special soil, plant and animal feed problems, and to demonstrate improved technology;

iii) Conduct applied research to delineate major problems in crop and animal production and where possible, to initiate and co-operate in projects to solve them; and

iv) Compile and summarize analytical data for recommendations, and diagnostic use.

i) Analyses and Recommendation Services

During the fiscal year 1983/84 a total of 49,744 samples were received for analyses representing an increase of 11,678 samples over the previous three year average. Most of this increase was due to the large numbers of research project samples tested for feeds, plants and soils. Producer sample numbers remained similar to those for the previous three years (Table 3).

TABLE 3. NUMBER OF SAMPLES ANALYZED IN 1983/84 AND AVERAGE FOR THREE PREVIOUS YEARS

	Feeds & Plants		Farm Soil		Greenhouse & Garden		Total	
Sample	Av. 3 Yrs.	1983/84	Av. 3 Yrs.	1983/84	Av. 3 Yrs.	1983/84	Av. 3 Yrs.	1983/84
Regular	4,200	4,322	11,811	10,081	1,875	3,318	17,886	17,721
Diagnostic	2,494	2,274	1,911	2,505	234	266	4,639	5,045
Research	5,046	14,426	10,494	12,552	--	--	15,540	26,978
TOTALS	11,740	21,022	24,216	25,138	2,109	3,584	38,065	49,744

* Fiscal Year - April 1 to March 31.

Producer use of private laboratory testing services in Alberta has been increasing. A recent survey indicated that during the year over 45,000 soil samples and nearly 30,000 feed and plant samples were tested for producers by five private laboratories in the province. Thus a total

of more than 92,000 samples were analyzed by testing facilities in the province to assist producers with management decisions regarding use of feed and soil resources.

Although the A.S.F.T.L. is continuing to provide a regular analyses service to producers, the laboratory emphasis is toward diagnostic support to district and regional staff, and to developmental research to improve analytical and diagnostic methods and recommendations.

ii) Diagnostic Services

These services are provided to Alberta Agriculture staff to assist in resolving production problems and demonstrate improved technology for producers. Use of this service increased by about 8% over the previous three year average. District Agriculturists were the largest users of the service as shown in Table 4.

TABLE 4. DIAGNOSTIC SERVICE SAMPLE VOLUME
Summary of the Users and sample volume of the diagnostic service during calendar year 1983.

Submitter	Sample Numbers		
	Soils		Plant & Feed
	Surface	SubSoil	
1. District Agriculturists/Fieldmen	694 (40) *	303	773 (35)
2. Regional Specialists	199 (11)	73	311 (14)
3. Soils Branch Specialists	344 (20)	139	238 (11)
4. Laboratory Staff at A.S.F.T.L.	382 (21)	127	734 (34)
5. Other Specialists	96 (9)	104	138
Total Samples	1,715	746	2,194
Number of Reports	464		752

(40) * = % of Total Surface & Subsoil

A recent survey of district and regional staff identified that this service was very useful to 92% of those surveyed for solving producer problems and to 65% for improving their understanding of production problems. Over 60% indicated they were on-farm demonstrations where analyses and consultation with laboratory specialists were important services.

iii) Applied Research Samples

This service is provided to assist soil, crop and animal specialist and researchers in the department and other public and private agencies with required analyses on agricultural research projects. Sample numbers for this service increased to nearly 30,000 which was 74% higher than the previous three year average. Much of this increase resulted from the use of the new near-infrared (NIR) technology which provides rapid analyses of plant tissue and animal feeds. Use of NIR has allowed more complete evaluation of the large numbers of plant and feed materials generated in research studies. For example, over 10,000 plant samples were tested for nutrient uptake by plants to identify efficiency of source, placement and timing of fertilizers. Previously this type of work was restricted primarily to crop yield response for evaluation of treatment effects. Primary users of this service are listed in Table 5.

TABLE 5. RESEARCH SERVICE SAMPLE VOLUME
Summary of the Users and sample volume of the research service during the calendar year 1983.

	Sample Numbers		
	Soils		Plant & Feed
Submitter	Surface	SubSoil	
1. Regional Specialists	107 (6)*	408	152 (1)
2. Soils Branch Specialists	323 (8)	501	3,125 (21)
3. Laboratory Staff at A.S.F.T.L.	55 (1)	69	5,689 (37)
4. University of Alberta	717 (7)	39	1,677 (11)
5. Other Government Departments	148 (3)	192	—
6. Agriculture Canada	4,325 (71)	2,835	1,108 (7)
7. Private Industry	123	249	3,505 (23)
TOTAL SAMPLES	5,798	4,365	15,256
NUMBER OF REPORTS	112		96
(6) * = % of total Surface & Subsoil	112		96

Commencing January 1, 1984 a more detailed review process was adopted for acceptance of research project samples for analyses. The intent is to focus research assistance to applied projects specifically directed to identify and solve agricultural production problems or limitations.

Agriculture Canada, the University of Alberta and private industry were large contributors of samples submitting over 60% of the total research samples tested. Specialists at the A.S.F.T.L. maintained close working relationships with researchers in the public and private sectors. Various research involvement and analyses services were provided for a wide range of production areas:

- supervision and analyses of soil and plants for the "Making the Most of Nitrogen Project" (Farming For The Future).
- trace mineral research to expand the data base for soil, plant and animal feeds and identify areas of potential deficiencies.
- analyses of forage and fecal material derived from U of A feed evaluation unit and forage fertilizer plots.
- macro nutrient research on crop requirement and utilization of nitrogen, phosphorus, potassium and sulfur under normal, minimal and zero tillage management.

iv) Data Compilation and Processing

Changes to the laboratory's data processing and reporting capabilities included:

- changes to the soil test report in response to extension staff to improve usefulness of the report.
- activation of Solonetzic Soils program to edit and store data.

These changes were done to meet the needs of extension and branch staff.

Considerable use was made of the laboratory's computer stored data base. These included:

- soil test nitrogen summary of fall soil samples.
- identification of acidic soils and their location.
- identification of soils having specific cropping history for Organic Carbon Content of Alberta Soils study.
- summary of laboratory soil and feed sample volume.

Computing facilities were also used to:

- complete data entry of soil survey information for computerized Soil Survey and Yield Potential project.
- analysis of data from the Making the Most of Nitrogen Project.

- Commencement of Forage Production project in co-operation with U of A and Land Resource Research Institute of Agriculture Canada, Ottawa.

v) Instrumentation & Methodology

Development and application of new and improved technology and methods is an ongoing function of the laboratory. Such work has expanded the analyses capability, speed and accuracy through studies conducted including:

- inductively coupled plasma emission spectrograph (ICP)
- near infrared reflectance spectroscopy (NIRS)
- auto sulfur analyzer
- atomic absorption spectrophotometer.

Trace nutrient analyses are becoming more significant factors in animal ration formulation and are regularly requested in tests for producer feeds. These nutrients also have a high profile in some areas of the province for crop production however their need is as yet only minor in comparison to animals. The ICP instrument is used extensively in studies related to trace nutrient analyses as indicated in Table 6:

TABLE 6. I.C.P. SAMPLE VOLUME

The number of samples analyzed for various materials and elements using I.C.P. Technology for years 1981, 1982 and 1983.

	Number of Samples For Each Fiscal Year*					
Category	1983/84	Percent of Total	1982/83	Percent of Total	1981/82	Percent of Total
Feed Extracts	3,800	34	3,776	35	1,476	33
Plant Tissue	171	1	434	4	76	2
Soil-D.T.P.A.-Cu, Zn, Mn, Fe	1,652	15	1,324	12	468	10
- Boron	1,144	10	1,214	11	247	6
- Total Digest (23 elements)	172	2	248	2	157	3
- Exch. & Ext. Cations***	829	7	905	8	807	18
- Sodic Soils	569	5	1,453	14	536	12
- Aluminum & Manganese	1,278	11	1,481	14	718	16
- Greenhouse (Spurway & Water)	1,697	15	---	--	--	
Total Analyses	11,312	--	10,835	--	4,485	--

* Fiscal Year - April 1 to March 31.
** D.T.P.A. for Cu, Zn, Mn, Fe, by Diethylenetriaminpentacetic acid.
*** Exch. & Ext. Cation - Exchangeable and Extractable Cations of Ca, Mg, Na and K by 1 N Ammonium Acetate.

Work was conducted on the NIRS system to apply this rapid and efficient technology to the needs of producers and research. During the year analyses equation for prediction of major quality constituents were developed or refined for grass, legume and mixed hay and silage; cereal grain and straw; and animal performance (digestible crude protein and energy and animal intake). Considerable assistance was provided to researchers in providing analyses and assistance to purchase and apply this technology to specific research needs. Laboratory staff presented workshop and papers, and attended symposia on the use and application of NIRS.

Other studies involving analyses and interpretation of laboratory results were:

- evaluation of zinc extractions and determination in soils particularly in relation to crops in southern Alberta.
- further studies of the determination of pH and lime requirement to correct soil acidity in central and northern Alberta.
- methods for handling soil and feed extracts with precipitates and particulate material through the ICP.
- greenhouse evaluation of need for copper fertilization to correct cropping problems on specific soils in central Alberta.
- evaluation of whey products from several cheese factories in Alberta to determine their suitability for use in land application.
- evaluation of extractions for determination of trace minerals in greenhouse soils.

D. ALBERTA TREE NURSERY AND HORTICULTURE CENTRE

a) EXTENSION SERVICES

During the winter months three horticultural short courses per agriculture region were provided. Direct contacts at the nursery resulted in 4,700 telephone inquiries.

Close liaison was maintained with the Alberta Horticulture Association, the Landscape Alberta Nursery Trades Association and various horticultural events organized by cities and towns throughout the province. Turf extension activity included contacts with sod growers and turf managers. Vegetable growers were provided with requested information; demonstrational research experimental plots for vegetable crops were maintained. A number of vegetable producer oriented education and development programs were organized. Assistance was provided to the Alberta Farmers Market Program.

Staff at the nursery conducted the annual pruning courses in March. Over 200 students from schools and the University of Alberta were offered tours of the nursery facilities.

b) THE SHELTERBELT PROGRAM

During the spring of 1983, 2.3 million shelterbelt plants were distributed to over 7,000 landowners. This planting stock was used for the following purposes:

Type of Planting	Number of Seedlings Used
Farmstead shelterbelts	1,700,000
Roadside hedges	237,000
Field shelterbelts	100,000
Acreage plantings	150,000
Townsite plantings	25,000
Replacements	80,000
TOTAL	2,292,000

c) THE PROVINCIAL PARKS PROGRAM

A total of 23,218 native trees were shipped to the various Provincial Parks. The native trees were shipped in 1, 2, and 5 gallon pots.

d) NURSERY PRODUCTION DURING 1983

During the winter months 1.8 million hardwood cuttings of poplar and willow were produced. For every three cuttings made, one rooted plant was harvested in the fall. 600,000 coniferous plants of spruce and pine were produced in the greenhouses. These seedlings were transplanted in the field during August.

Seeding was done in the late spring, summer, and fall of 1983. The following amounts were seeded at the approximate rate of 500 viable seeds per metre.

Type	Number of Metres, Not Including Caragana
Tall Deciduous	3,635.0
Small Deciduous	2,432.5
Hedge Plants	10,061.0
Conservation Bundle	1,559.0
Coniferous	279.0
Miscellaneous	558.0

Caragana was seeded in a new field west of existing nursery grounds. 7.0 hectares were seeded July 15th. A fall inventory showed 14 plants per metre (1.9 million caragana). A second seeding of two hectares took place on August 24th.

Plant material was lifted and graded from September 26th to December 8th, including 145,000 plants from the container section. The material to be used in 1984 shipping amounts to the following:

Tall Deciduous	789,680	Conservation Bundle	1,474
Small Deciduous	591,975	Coniferous Plants	81,870
Hedge Plants	991,940	Miscellaneous	37,800

Seed collecting and extraction to support the production schedule was as follows:

Collected Species	Date of Harvest	Date of Fruit/Cones Picked (kg)	Yield of Clean Seed (kg)
Tall Deciduous	1.6 - 20.10.83	253	142
Small Deciduous	19.7 - 11.10.83	1,087	157
Hedge Plants	18.7 - 13.10.83	2,768	220
Coniferous Trees	15.8 - 27.10.83	1,422	81
TOTAL		5,530	537

e) RESEARCH

Applied research projects were carried out; these projects dealt with investigations in:

1. Lawn establishment and maintenance
2. Vegetable testing and production
3. Woody plant production and testing
4. Seed germination and seeding practices
5. Weed control methods for nursery crops

E. ALBERTA HORTICULTURAL RESEARCH CENTER

Final evaluation of twenty advanced apple selections from the Co-operative Fruit Breeding program is nearing completion. Thirty-two test orchards are now fully established province wide. A mechanical harvester was successfully tested on commercial saskatoon orchards in the province.

Production and management practices of greenhouse vegetables (tomatoes, European seedless cucumbers) and floriculture crops were evaluated. Information was generated on the production of alternate greenhouse crops such as peppers, eggplants, Chinese vegetables, Alstromeria lily and gerberas. Emphasis was also placed on the use of hydroponic systems for greenhouse crops.

The Greenhouse Energy program continued to offer general extension services to growers and industry on greenhouse energy and conservation and on the use of reject heat. Controlled root temperature studies were continued and expanded to include several new crops.

AHRC is one of nine sites for the prairie regional woody ornamentals trial which evaluates new woody plant introductions for their hardiness and ornamental value over a five year period. This major trial and the hardiness testing of new ornamental introductions, roses and perennials and container trials for woody ornamentals, constitute the major components of the Ornamentals program.

Demonstrated improvement in earliness and yields of selected vegetable crops with plastic mulches and tunnels has resulted in increased use of this technique by Alberta producers during the past year.

The Vegetable program continued to emphasize field production through the evaluation of plant populations, transplanting methods and cultivar trials.

Evaluation of potato cultivars in the Prairie Potato Regional Trials was continued. Various aspects of management practice were investigated as well.

With continued input from Farming For The Future, the Special Crops program focused on cultural, cultivar and adaptability trials of leguminous crops, forages and herbs and spices. The test plot at Bow Island was relocated.

Evaluation of selected herbicides was continued for vegetable, special and nursery crops. The effect of residues from herbicides applied in previous years was studied in replanting trials.

The Apiculture/Entomology program included honeybee colony management and overwintering trials. Other areas of principal involvement were the monitoring of leafminer populations in greenhouses and European corn borer survey and control trials.

The Food Processing and Quality Evaluation program continued to evaluate new processes and products for fruit and vegetable crops. Chemical, sensory and processing studies were conducted on crops grown at AHRC and elsewhere.

Handling and storage studies on root crop vegetables, potatoes and nursery stock were continued in the Post Harvest Physiology program.

The research component of the Plant Pathology program focused on studies of forage, greenhouse and pulse diseases and their control. The AHRC Regional Crop Laboratory received approximately 1600 plant disease, insect and weed specimens for diagnosis in 1983.

A more comprehensive description of AHRC research and extension activities may be obtained by requesting the 1983 Alberta Horticultural Research Center Annual Report. Details concerning cultivar evaluation trials on various crops are available in the AHRC Pamphlet series.

IV. REGIONAL REPORTS

REGION ONE - LETHBRIDGE

The main climatic feature of the summer was two severe hail storms which ran from west to east the first and second weeks of July on a track southwest of Lethbridge and sixty miles to the east (Seven Persons). The late spring frosts caused considerable damage to row crops, especially sugar beets which were reseeded on thousands of acres. The soft white spring wheat acreage increased very dramatically on irrigation to over 400,000 acres. Five consensus surveys were conducted which served as the focus of a number of area production meetings for irrigation and dryland farmers. The variety testing program for cereals and oilseeds has proven to be very useful with plots in the Vulcan, Brooks, Bow Island and Lethbridge areas. The interest in triple M, soft white wheats and other possible involvements or alternatives underlines the poor delivery quotas for hard red spring wheat as producers tried many alternatives.

This diversification was also expressed in the interest of alfalfa plants, one of which is in operation at Medicine Hat and another under development at Bow Island. Together these two plants will process about 8000 acres of alfalfa.

The European Corn Borer continued to spread but at this time it is an economic pest only of corn. Cultivation and spot treatment has been used to prevent the rapid spread of this disease.

The cooperative attitude of adjacent jurisdictions (British Columbia and Montana) and the assistance of customs and inspection officials has greatly facilitated the eradication program which has been carried out against Spotted and Diffuse knapweeds. This same quality of cooperation with local government and other Alberta Government agencies has vastly improved the effectiveness of the Leafy Spurge containment program which is centered along the southern most part of the South Saskatchewan River drainage system.

Verticillium wilt of alfalfa was confined to irrigated areas where cultural controls seem to have prevented the rapid spread and large losses. Hay and pasture on dryland preformed only about average with some areas cutting only the sloughs on sub-irrigated meadows.

Soil erosion was not a big problem despite the low rainfall which is tribute to the farmers and their farming methods. The dry fall made harvesting smooth but creates some uncertainty about the 1984 fall sown crops.

Programs designed to emphasize specific cultivated weed problems such as Canada Thistle and Field Bindweed were continued and expanded.

Dryland Salinity Program

Climatic and economic conditions were the two factors which had the greatest effect on the vegetative salinity control program. A moist spring had many farmers optimistic but conditions turned dry and only farmers who had properly applied the required technology received any benefit. Yields in general were not bad however. Several farmers were interested in growing alfalfa in their recharge area but the "PIK" (Payment in Kind) program in the United States depleted most desired seed sources. As well, alfalfa and grass seed prices soared. We are optimistic that 1984 will be more attractive to forage production and continuous cropping.

1983-84 was an expansion year for the salinity investigation program. To date over 100 applications have been received from the County of Warner, the M.D. of Taber, M.D. of Willow Creek, County of Lethbridge, County of Vulcan, I.D. #1 (Medicine Hat) and the County of Forty-Mile. All the farmers data are in the process of being put on the IBM Personal Computer LOTUS program. Up to date records of progress and attractive reports will be readily available. The new areas were divided up between PFRA and Alberta Agriculture. Alberta Environment will continue to service the Warner area.

The water well data taken by farmers and other government agencies is being logged on the Radio Shack TRS 80 personal computer on the Visical program. This program graphs the progress being made in reducing water tables. So far there is little progress to report.

Several salinity plots were put out in 1983. Soils Branch put in a fertilizer plot to test several fertilizer rates on dryland barley.

Field Crops put a number of speciality crops on a saline area to test their salt tolerance. Twenty-one grass varieties were seeded in a saline seep. An alfalfa variety plot was also planted with 10 cultivars.

An on-farm demonstration project was seeded with two alfalfa varieties, Beaver and Rambler being compared. The dry summer and an insect problem in the fall may have reduced the stand. It's a wait and see situation.

Several tours were hosted through this past year to demonstrate the principles of dryland salinity control. Groups from Saskatchewan and Montana as well as several local farmer groups were shown what is being done.

A Salinity Conference was held on March 21 bringing in all local speakers who are working on the problem as well as Dr. Paul Brown from Montana State University.

Several new areas of salinity were and are being investigated. The D.S.C.A. is making a proposal to Canada/Alberta Hail and Crop for changes to their program to better assist farmers to hedge their risk.

Several on-farm demonstrations were applied for and approved for 1984. One is on snow management which is a regional study. One is on dryland alfalfa seed production and the others are basic alfalfa production.

Special Crops

The acreage of special crops in Alberta was 200,900 A in 1983 as compared to 206,400 A in 1982. Acreage in 1983 declined significantly in lentils and dry beans while mustard, corn silage, grain corn and alfalfa seed experienced acreage increases. Acreage in 1984 will increase by 15-20% due to the less than optimistic outlook in the soft and hard red spring wheat market. Approximately 75-80% of the special crop acreage is grown in Region I with Regions III, IV, and V providing the majority of the remaining acreage.

The pulse industry is continuing to expand as the production of peas and fababeans moves northward. The Pulse Growers Association of Alberta has been very active in the Lethbridge/Bow Island and Camrose/Edmonton areas and is obtaining more and more support from north and east of Edmonton. Overall, all pulse crops are expanding with the main market thrusts being in southern Alberta, the export market and in central Alberta, the domestic feed market.

The 1983 dry bean market situation improved over the price levels obtained in 1981 and 1982. This increase in price levels from 12-14¢/lb to 20-24¢/lb has renewed some optimism in the bean growing area. Average yields in 1983 were 1,533 lbs/A.

Dry pea production is also on the increase as more acres of commercial peas and seed peas are being grown on irrigation. There appears to be considerable interest in peas as a rotational crop under irrigated conditions.

Grain corn is going through a period of slow stable growth as producers improve their production practices and Alberta corn continues to expand its share of the corn market in Alberta. As producers' confidence increases and earlier hybrids arrive the acreage of grain corn should continue to expand. Also, dryland corn is proving to be a viable addition for corn growers who have both irrigated and rain fed land. Average summerfallow yields for dryland corn from 1981-1983 is

46 bus/A. Average yields for irrigated corn in 1983 was 95-100 bus/A.

The mustard industry suffered through a disastrous year in 1983 with the hot, dry weather in August and the painted lady larvae frass in many seed samples. Average yields were very low at 750-850 lbs/A. and many fields in the Lethbridge/Warner area were heavily contaminated with larval frass which was extremely difficult to remove from the sample. The contamination was a once in a lifetime situation that should not occur again for many years. With the shortage of mustard in 1983 the 1984 contract prices will stimulate a 25% acreage increase in 1984.

During 1983, the Special Crop Specialist presented information at 12 producer meetings on dryland and irrigated crop topics. The Special Crop Specialist is the Secretary-Treasurer for the Pulse Growers Association of Alberta, Treasurer for the Alberta Corn Committee, and Secretary for the Pulse Sub-committee, resulting in a number of meetings attended. Also serving as Chairman of the registration committee for the N.A.I.C. to be held in July, 1984. Organized, or assisted in organizing, five summer tours involving safflower, sunflowers, corn and pulse crops.

Four editions of the "Nukrop News" with a circulation of 250 and 2 editions of the "Corn Binder" with a circulation of 550 were published. The Agrifax bulletin on Sunflower Production and a bulletin on Special Crop Trial results from 1983 were developed.

Various trials and demonstrations were put out in 30 locations throughout southern Alberta. The main programs included: "Proper Inoculation of Pulse Crops", "Safflower Viability Study", "Sunflower Agronomy Studies" and "Corn Agronomy Studies".

Attached is the production and grass value estimates of several special crops grown in the province.

ALBERTA SPECIAL CROP PRODUCTION AND GROSS VALUE ESTIMATES - 1983

CROP	Acreage 1982	Acreage 1983	Average Yield (kg/A) 1982	Average Yield (kg/A) 1983	Average Producer Prices ($/T) 1982	Average Producer Prices ($/T) 1983
Alfalfa Seed	12,000	15,000	113.5	102	--	$1,650.
Buckwheat	1,330	3,500	272	300	275	230.
Canaryseed	15,000	8,200	544	546	308	250.
Caraway	--	650	--	Establishment Year	--	880
Coriander	300	250	--	318	--	484.
Corn - Grain	10,000	12,000	2,286	2,673	144	177.
- Silage	20,000	24,000	15,500	17,500	30	35.
- Sweet	5,000	5,000	--	--	--	--
Fababeans - Grain	8,000	3,400	1,361	1,091	198	160.
Fenugreek	140	200				
Fibre Flax	5	30	419 seed/ 1,588 fibre	200 seed/ 1,000 fibre	--	--
Field Beans	8,200	3,000	658	727	308	460.
- Processing	322	420	--	--	--	--
Field Peas	13,000	13,500	1,179	1,100	257*	253.*
- Processing	4,500	4,200	--	--	--	--
Lentils	10,000	2,600	408	300	396	400.
Mustard	55,000	65,000	544	386	286	374.
Safflower	--	108	--	340	--	308.
Sorghum	--	5	--	--	--	--
Soybean	3	--	--	--	--	--
Sugar Beets	32,349	32,000	15-16T	19-20T	--	--
Sunflowers	1,200	1,800	1,089	1,022	330	352.**
Triticale	10,000	6,000	800	890	132	140.

* Weighted Average (Seed & Commercial Peas)

** Weighted Average (Confection & Oil)

November, 1983

Blair Roth, Special Crops Specialist
(ADA) Agriculture Center, Lethbridge

REGION TWO - AIRDRIE

The production of crops in Region II during 1983 was good relative to many other regions in the Province. Yields were reduced only slightly despite abnormally low precipitation (60-70% of normal) during the growing season and extreme heat in late July and all of August. This condition was common across the region except for the eastern edge (Oyen to Acadia Valley) where rainfall was above average. The dry hot conditions affected barley crops the most with spotty reports of light bushel weight.

Fall harvest weather was ideal resulting in a large majority of crops in the bin by the end of August. A long open fall enabled farmers to do any required fall work. Fall soil moisture conditions were extremely dry. A number of farmers reportedly stopped fall fertilizing because of the dry lumpy conditions and high power requirements to pull implements.

The weather through the winter of 1983-84 was also dry and warm. This was a blessing to cattle feeding operations but lack of snow cover will no doubt result in little or no runoff and potential stock water shortages. There is also a great concern that 1984 crop prospects will be threatened if the dry conditions continue.

Soil degradation continues to receive a great deal of attention in the region with courses, tours and publicity focusing on the increasing concern of soil problems.

The Nodding Thistle Control Program in and around the City of Calgary was supervised again. While the big patches are being eliminated, very small and isolated patches are showing up in the M.D. of Rocky View. Russian Knapweed infestations were held in check with few new flare-ups reported.

A great deal of time was spent working with the twelve Seed Cleaning Plants in the Region. Volume of seed cleaned was up generally and all

plants reported a successful year. A start was made on rebuilding the sixth steel plant in the region at Carstairs. The Calgary Seed Fair and Hay Show probably had the best show and seed exhibit since its inception, with this office constructing and exhibiting a new "Crops Grown in Alberta" display.

This office also worked closely with the Region's Agricultural Service Boards to co-ordinate and facilitate effective district programs.

Foothills Forage Co-op made the decision to cease operating under their formal mandate and it will continue on into 1984 as a voluntarily run organization.

The Chinook Applied Research Association, (C.A.R.A.) reported another successful and busy year in the Hanna - Oyen areas.

Crop production courses were emphasised throughout the region, featuring barley, wheat and canola, and for the most part, they were very successful.

A brighter cereal and oilseeds crop situation no doubt had a negative influence on specialty and horticultural crops throughout the region. Acreage remained small.

REGION THREE - RED DEER

Climatic conditions fluctuated widely throughout the year and reduced yields were the result. The winter was mild with very little snow cover. Virtually no run-off occurred so dugouts were dry and spring moisture reserves were low. The spring was cool and dry resulting in slow and uneven crop germination. When the rains came in mid-June, it was in excess, and many districts suffered flooding in low areas or where heavy soils predominate. The fall was hot and dry, and some of the barley fields ripened prematurely giving light bushel weights.

At the beginning of the year, market prospects were uncertain. Barley quotas were low so producers switched some of their acreage to canola and wheat. The wheat production was Near normal but the canola yields were down considerably from previous years as it could not adapt to the climatic extremes as wheat could. Barley yields were down also. Although the forage yield was average, most of the growth came late in the year and haying was running into harvest.

Seed cleaning plants in the region cleaned near record volumes with over 4.4 million bushels cleaned. Many associations took advantage of the up-grading program to improve service and expand facilities.

Because of the heavy rain in mid-June, many producers did not get their fields sprayed as planned. Infestations of perennial weeds - especially Canada thistle - increased significantly.

Producer concern at extension meetings really focused on new varieties, fertilizer use and efficiency, and new herbicides. The availability of liquid fertilizers increased as one or two agents expanded to include this option.

A firm in Rocky Mountain House began pelleting lime for use to improve acid soils.

Demand for horticulture information remained strong. Courses on pruning, vegetable production and farmstead planning were popular and requests for service often outstrip staff availability.

Although intestations of forest tent caterpillars decreased slightly, grasshoppers and bertha armyworms increased. A small amount of spraying for grasshopper control was carried out in the eastern districts. The forecast for next year looks significantly higher.

Diseases in cereals increased slightly with glume blotch and root rot occurring in wheat, and root rot and leaf diseases in barley. Sclerotina in canola was down as climatic conditions didn't favor its development.

Grain stocks on farms remain high at year end. Initial Canadian Wheat Board prices were down considerably in the new crop year and quotas - especially for wheat - have been low. Country elevators are congested and any space created by boxcar shipments is quickly filled. Wheat movement is particularly slow. With the slower grain movement, interest in special crops is on the upswing.

REGION FOUR - VERMILION

The following is a short summary of some of the major trends and concerns in the Plant Industry Section in Region IV in 1983.

Soils and Soil Conservation

A dry spring followed by excessive moisture in many districts caused problems because of erosion, variable crop maturity and excessive weed growth. The southwest portion of the region became waterlogged by 10-20 inches of rain. This is creating a "water-charged" area. Soil salinity will become evident as this area begins to discharge in the spring of 1984 or when drier conditions return. Rotations, soil management and more continuous cropping appear to be the only alternatives to overcome the problem.

Anhydrous ammonia, banded dry fertilizer and some Cold-Flo are all becoming accepted fertilizer practices. The physical application, i.e. machines for Cold-Flo have been causing some concern. Soil type, moisture conditions and soil temperature have been problems especially in the northern half of the region.

Soil pH levels continue to show a gradual downward movement. The use of lime continues to be on the demonstration plot basis. In most situations the soil pH levels are not low enough to have plant growth drastically affected by the addition of lime.

The amount of summerfallow in Region IV is gradually dropping. However, the continued emphasis on longer crop rotations, green manuring and forage production must remain a priority. This will become more important as dryland salinity appears on large areas of moisture discharge as opposed to local saline seep areas.

Field Crops

A dry spring followed by improved moisture conditions produced an average to slightly above average cereal and oilseed harvest. Many districts in the central portion of the region received excessive rains

in late June and July which drowned out stands, produced second growth and lowered yield and grades.

Native pastures continue to be dependent on summer rains. Most are overgrazed and have no reserve grass present. I can see little change in this situation. More interest in annual pastures and rotational grazing is evident each year and is an important consideration.

Interest in alternative crops, fababeans in particular, is growing in the western half of Region IV. These are being used for silage, grain and green manure, especially in the "milkshed" areas. More information is required on varieties and management practices suitable for northern and central Alberta production.

Several of the new cereal and oilseed varieties were extensively grown with most doing very well. The regional cereal and oilseed variety plots are offering excellent production information to the producer. This information is especially useful as the number of variety alternatives grows.

A plot of fiber flax was grown in the Vermilion area in 1983. The plot produced seed and fiber of good yield and quality. The processing and marketing of the fiber continues to be a problem and will limit any future production until the problem is overcome.

Producer use of the municipal seed cleaning plants remains high. Several plants participated in the upgrading program and improved their cleaning capability and capacity. Total cleaning for seed and commercial separations totalled approximately 7.5 million bushels. These plants continue to carry out a very important role to Agriculture in Alberta.

Pest Control/Disease Control

The grasshopper problem grew in 1983 in the eastern portion of the region. Particular problems were encountered especially on rangeland in the M.D.'s of Wainwright and Provost and the County of Vermilion River.

The potential problem for 1984 could be high.

Of particular concern is the instance of disease in oilseeds. Sclerotinia stem rot is becoming more widespread each year. All canola producing districts encountered this disease in 1983. The cost of chemical treatment combined with the decision of spraying or not are producer concerns. The possible spread of virulent blackleg into canola in 1984 in Region IV is a distinct possibility.

Mosquito problems were encountered by cattle producers along streams, creeks and ponding areas. In many cases the problem was present before any control measures were considered.

In the Lac La Biche area, blackflies continued to be a problem for livestock producers. In other areas livestock pests including various fly species and mosquitoes were major problems to producers in 1983.

Horticulture

Interest remained good for shelterbelt planting and farmstead beautification. Farm people are interested in obtaining assistance in planning, selection of materials and care information. The demand for this type of assistance often outstrips availability.

The Market Garden Incentive Program involved eight applications from Region IV. As in previous years, there is no trend towards an increase in market garden type production. People continue to be discouraged by the amount of work involved in market garden production. Potato seed production is being carried on as a specialized operation by two or three operators and this offers potential for growth.

Clearing of the remaining bluffs, fencelines, and pasture land continued in 1983. The fenceline-to-fenceline clearing continues to offer concern in regard to soil conservation and management. Field shelterbelts have not become a popular alternative when fence-to-fence clearing is carried out.

The disease, Tobacco Rattle Virus, was diagnosed in several home potato gardens. This disease could cause serious problems to the potato seed industry if it became widespread.

Weed Control

Adverse weather conditions during the spraying season hampered not only the spraying itself, but also the degree of control achieved. Lack of control, crop damage, weed regrowth were all encountered. It may take a season or two to overcome some of the problems created in 1983. Canada thistle and perennial sow thistle were especially noticeable and flourished under ideal growing conditions and in many cases marginal chemical control. Other species of concern included scentless chamomile, toadflax, leafy spurge, tansy, corn spurry, cleavers and annuals such as wild oats, green foxtail.

Producers continue to pose questions concerning aspen invasion of range and pasture land. Unfortunately control measures offer no new alternatives.

The Agricultural Service Boards carried out extensive programs in weed control. Particular programs were encountered in several areas from absentee landlords or farm operators. This was particularly true with the abundance of Canada thistle and sow thistle in 1983. The after affects of this problem will be seen for several years in the future.

REGION FIVE - BARRHEAD

The total 1983 crop season precipitation was above normal but its distribution was extremely erratic starting with spring drought conditions, then up to 15 inches (375 mm) of rain in some districts from June 18 to July 26, followed by dry weather and crop heat stress in August. Spring germination of shallow-sown crops such as canola and underseeded forage was uneven due to dry soil. Growth of all crops including perennial pasture and hay was unusually slow until late June.

Cereal and canola yields ranged widely from poor to normal. Crops on level land with poor draining subsoil suffered from excessive July rainfall.

Weed control was difficult in 1983 due to wet soft fields during the normal spraying season. Demand for aerial herbicide applications exceeded available custom capacity. Canada thistle infestations were extensive throughout Region V. Scentless chamomile continued to spread in areas south and west of Edmonton.

Insects were not a major hazard to crop production in 1983. Grasshoppers, a rarity in this region until the last 3 to 4 years, damaged crops and gardens in several districts in a line from Drayton Valley to Athabasca. A potential Bertha armyworm outbreak as indicated by moth monitoring did not develop. Canola root maggots were widespread. Flea beetles and cutworms caused isolated concerns.

Diseases causing yield reductions included root rots, cereal smuts and leaf diseases, and canola sclerotinia and alternaria.

Although most farmers are convinced that fertilizers must be applied to get high yields, some cutbacks in rates were made due to the current cost-price situation.

A copper deficiency in barley grown on peaty soil in the Westlock area was diagnosed via application of several micronutrients and plant

tissue analyses.

Interest remained high in horticultural extension courses involving farmstead beautification, gardening, pruning and grafting.

Twelve Agricultural Service Boards, including a new one formed to serve the eastern area of I.D. #17, carried out active programs in soil conservation; weed, insect, predator and beaver control; and various field demonstrations and tours. Budget restraints caused shelving of numerous desired projects.

The 3,618,141 incoming bushels handled by 10 Co-op seed cleaning plants for the year ended June 30, 1983 was 20% below the record high set the previous year. The chief cause of this decline was a substantial increase in canola production coupled with a reduction in barley acreage.

REGION SIX - FAIRVIEW

The major highlight for 1983 was the bumper crop of wheat practically throughout the Peace and a record high for this region of one million acres. Barley crops were generally better than average and also included some bumper yields. The odd canola crop too was exceptional but many promising fields were substantially damaged by the excess rainfall during the latter half of the season bringing the regional yield average down to only the long term average.

We had an opportunity to see the best in some of the alternate crops, namely canary seed, with some fields yielding nearly 40 bushels per acre. Lentils on the other hand fared poorly under the wet conditions as legume seed crops often do.

Forage seed yields of grasses ranged from average to slightly above while forage legume seed yields ranged from 0 to poor.

1983 was also a year during which most of the Peace region experienced near similar growing and moisture conditions. Exceptions are the Rycroft area and smaller parts of Valleyview and High Prairie which had excessive rainfall, and most of Ft. Vermilion which was excessively dry. The harvest season, though mainly damp, was lengthy enough to permit complete harvest and extensive fall work.

Trials and demonstrations for 1983 included several aspects of crop management, crop varieties and weed control.

a) Crop soil management - Red clover plowdown on loam to silt loams in July of 1981, brought about 100% yield increase in wheat and barley in 1982 under drought conditions but no additional yield increases were measurable in 1983. Similar clover plowdown on clay soils resulted in modest yield increases in 1982 with no measurable residual benefit in 1983.

b) Tangier flat peas planted in 1983 for visual appraisal for potential plowdown and seed production capability produced an abundance of plant growth but the seed production require further experimentation and evaluation.

c) Coated canola field scale trials were completed on 10 different farms in the Peace. It was almost an unanimous conclusion that the coated and treated canola yielded identical to seed that was treated only.

Demonstrations

d) Cultural-chemical control of Canada Thistle and Perennial Sow Thistle was continued for 1983 but with appropriate modifications to counter drought conditions.

e) Fall rye plots, established in the fall of 1982 to evaluate the effects of seeding dates on winter survival and yield, suffered substantial and uniform winter injury from snow mold across all seeding date treatments (August 14, 21, 28, September 4).

Extension

The demands for extension were heavy for 1983/84 and included the following main areas.

1. Seed quality and varieties.
2. Barley and canola production practices.
3. Fall tillage and wild oat control and in crop treatment for wild oats and broadleaf weeds.
4. Perennial weed control.
5. Specialty crop production.

Seed Plants and Seed Cleaning

The last major area requiring seed cleaning services obtained a modest but very adequate facility at High Level. The Peace now has no obvious voids in seed cleaning services.

A two day seed cleaners seminar jointly organized by the Fairview Collage and Alberta Agriculture was well attended and well received. Seed plant inspections were conducted on the 14 municipal and 7 private cleaning plants and it can be concluded that most plants are offering very good services and some are improving where necessary.

Agriculture Service Boards

Substantial involvement with Agriculture Service Board activities continued with assistance provided in the area of development of field trials and tours, to enforcement and perennial weed control.

V. RESEARCH PROJECTS

INVENTORY OF PLANT INDUSTRY RESEARCH PROJECTS - 1983

Projects	Pages	PMY	TMY
Cereals and Oilseeds		3.85	24.45
Forage Crops		4.05	10.15
Special Crops		2.65	3.85
Ornamentals, Trees and Shelterbelts		1.61	3.47
Fruit Crops		.83	2.14
Vegetables and Potatoes		2.70	5.52
Greenhouse Crops and Greenhouse Energy		1.65	2.75
Soil Management - Fertilizers - Analysis		1.44	4.90
Weed Control		2.29	3.20
Apiculture/Entomology		0.80	0.85
TOTALS		21.87	61.28

CEREALS & OILSEEDS

PROJECT TITLE	TRIAL LOCATION	RESEARCHERS	AGENCY	STATUS AND REPORTED	PMY	TMY
Feed Grain Breeding - to develop high yielding adapted varieties of feed grains with emphasis on protein content and quality. Barley	2 sites in Area 2 4 sites in Area 3 3 sites in Area 4 Saskatoon, Sask.	J. Helm D. Salmon F. Mederick	Field Crops A.R.C.	Ongoing. Reported Field Crops	1.25	11.25
Cereal & Oilseed Regional Variety Trials on barley, wheat, oats, flax and rapeseed	4 sites in Area 1 3 sites in Area 2 4 sites in Area 3 5 sites in Area 4 7 sites in Area 5 6 sites in Area 6 4 sites in Irrigation	J. Helm D. Salmon B. Wolfe M. Kaufman K. May R. Gaudiel A. Kondra	Field Crops F.F.F. Agr. Canada Beaverlodge Lacombe Lethbridge A.H.R.C. U. of Alberta	Ongoing. Reported Cereal & Oilseed Advisory Committee, Field Crops and Agricultural Research Council	0.30	8.00
Agronomic research on high moisture grain production	Lacombe Olds	J. Helm D. Salmon F. Mederick	Field Crops	Ongoing. Reported Field Crops	0.40	2.00
Expansion of winter wheat, spring triticale and winter triticale	Lacombe Olds	J. Helm D. Salmon F. Mederick	Field Crops	Ongoing. Reported Field Crops and Agricultural Research Council	1.00	2.20
Screening seed treatment fungicides for efficacy against stem smut of fall rye and bunt of winter wheat	Lethbridge Brooks	G. Puchalski R. Howard	Agr. Canada Lethbridge A.H.R.C.	A.H.R.C. Annual Report 1983. E.C.P.U.A. Pesticide Research Report 1983	0.10	0.20
Biology and damage assessment for <u>Lygus sp.</u> infesting Canola	Province wide	R. Butts	Reg. Crops Lab	Ongoing. Annual Report available.	0.50	0.50

CEREALS & OILSEEDS (continued)

PROJECT TITLE	TRIAL LOCATION	RESEARCHERS	AGENCY	STATUS AND REPORTED	PMY	TMY
Insecticide foliar sprays for thrips in Barley	Fairview	R. Butts	Reg. Crops Lab Fairview	Ongoing. Will be reported in E.C.P.U.A. Report 1984	0.10	0.10
Granular and seed dressing insecticide trials in Canola	Fairview	R. Butts	Reg. Crops Lab Fairview	Complete. Will be reported in E.C.P.U.A. 1984	0.10	0.10
Control of leaf disease in barley with aerially applied fungicide	5 sites in Westlock area	R. Bjorge T. Evans G. Woods T. Parsons	Extension Crop Protection Ciba Geigy Dupont Chemical	Initiated. 1984	0.10	0.10

FORAGE CROPS

PROJECT TITLE	TRIAL LOCATION	RESEARCHERS	AGENCY	STATUS AND REPORTED	PMY	TMY
Agronomic research and regional testing of forage crops	5 sites in S. Alta. 4 sites in C. Alta. Brooks, Monitor, Longview, Standard, Bow Island, Lacombe, Camrose, Vermilion, Lac La Biche	J. Helm L. Folkins R. Gaudiel	Field Crops F.F.F. A.H.R.C.	Final year. Reported Field Crops, A.H.R.C., and Agricultural Research Council	1.20	6.80
Annual forage crops for Alberta	Brooks, Bigstone, Standard, Longview, +6 other locations in C & N Alberta	G. Riemer R. Gaudiel B. Berkenkamp	F.F.F. A.H.R.C. Agr. Canada Lacombe	Terminated March 30, 1984. A.H.R.C. Annual Report and A.H.R.C. Pamphlet 83-6	1.05	0.10
Alfalfa breeding	Edmonton	P. Walton	U. of Alberta	Ongoing.	0.05	0.45
Forage cultivar evaluation	Peace River District	H. Neyda M. Rudakewich	Agr. Canada Beaverlodge Field Crops	Ongoing.	0.10	0.50
Crop response to Red Clover green manure plowdown	Peace River District	M. Rudakewich	Field Crops	Ongoing.	0.05	0.20
Verticillium wilt of alfalfa	Brooks Lethbridge S. Alberta	R. Howard H. Huang G. Flores	A.H.R.C. Agr. Canada Lethbridge AEC, Vegreville	Disease surverys and ongoing trials. A.H.R.C. Annual Report 1983. Alberta Forage Advisory Committee. Plant Pathology Society of Alberta. Scientific Journals.	0.75	1.00

FORAGE CROPS (continued)

PROJECT TITLE	TRIAL LOCATION	RESEARCHERS	AGENCY	STATUS AND REPORTED	PMY	IMY
Insecticide foliar sprays in alfalfa	Fairview	R. Butts	Reg. Crops Lab	Complete. E.C.P.U.A. Report 1983	0.10	0.10
Alfalfa pest management	Peace River	R. Butts	Reg. Crops Lab	Complete. Final report available.	0.75	1.00
Salt tolerant grass trial	Stirling	D. Wentz H. Vander Pluym	Alberta Agric. Alberta Agric.	Ongoing.		
Alfalfa rooting depth	Warner	D. Wentz R. Koots B. Norris	Alberta Agric. Alberta Agric. Farm Demo	1983-1988		
Alfalfa variety trial	Warner	D. Wentz R. Koots B. Thomas	Farm Demo	1984-1988		
Alfalfa feed trial	Wrentham	D. Wentz P. Koots H. Culler	Farm Demo	1984-1988		
Alfalfa grass mix trial	Warner	D. Wentz R. Koots B. Atkins	Farm Demo	1984-1988		
Alfalfa seed production	Milk River	D. Wentz R. Koots D. Welsh	Farm Demo	1984-1988		

FORAGE CROPS (continued)

PROJECT TITLE	TRIAL LOCATION	RESEARCHERS	AGENCY	STATUS AND REPORTED	PMY	TMY
Snow management	Region I	D. Wentz Reg. I D.A.'s DSCA	Farm Demo	1984-1988		

SPECIAL CROPS

PROJECT TITLE	TRIAL LOCATION	RESEARCHERS	AGENCY	STATUS AND REPORTED	PMY	TMY
Irrigated and Dryland Fiber Flax - agronomics and quality	Lethbridge Vermilion Evansburg	B. Park Blair Roth Ellis Treffry	Field Crops Field Services Field Services	Year 3. Completed. Reported to S.C.A.C. and Crop Research and Development Program	0.15	0.25
Agronomic Studies on Corn - Dryland Corn Study - Varietal	Seven Persons Bow Island Burdett Scandia, Warner, Lethbridge	Blair Roth Dave Major	Field Services C.D.A., Lethbridge	Ongoing. Reported to A.C.C., Corn Binder, and S.C.A.C.	0.15	0.30
Agronomic Studies on Sunflowers - Varieties - Weed Control, Insect and Disease Control	Bow Island	Blair Roth H. Huang R. Gaudiel	Field Services C.D.A., Lethbridge- (Disease Project Leader) A.H.R.C.	Year 3. Reported to S.C.A.C., Sunflower School, and Alta. Sunflower Seeds	0.15	0.25
Proper Inoculation of Pulse Crops	Bow Island Barnwell Grassy Lake Cranford Lethbridge Claresholm	Blair Roth R. Rennie	Field Services C.D.A., Lethbridge Pulse Growers Assn. of Alta.	Year 2. Reported to S.C.A.C., P.G.A.A., NuKrop News, Soil Science Workshop, and various Farm Seminars	0.15	0.30
Safflower Viability Study	Milk River Carmangay Champion	Blair Roth H.H. Muendel	Field Services C.D.A., Lethbridge	Year 1. Reported to S.C.A.C.	0.05	0.10

SPECIAL CROPS (continued)

PROJECT TITLE	TRIAL LOCATION	RESEARCHERS	AGENCY	STATUS AND REPORTED	PMY	TMY
Field bean cultivar and cultural trials	Brooks Bow Island Standard	R. Gaudiel	A.H.R.C.	Active. A.H.R.C. Annual Report 1983 Alberta Pulse Committee 1983	0.20	0.35
New crop cultivar, cultural and adaptation trials	Brooks Bow Island Standard Acadia Valley	R. Gaudiel	A.H.R.C.	Active. A.H.R.C. Annual Report 1983 Special Crops Committee 1983 Pulse Crops Committee 1983 Expert Committee 1983 Growers Meetings 1983	0.40	0.60
Herbs and spices cultural and adaptability	Brooks	R. Gaudiel	A.H.R.C.	Active. A.H.R.C. Annual Report 1983 Growers Seminar	0.05	0.05
Corn and sorghum cultivar and cultural	Brooks Bow Island Standard	R. Gaudiel	A.H.R.C.	Active. A.H.R.C. Annual Report 1983 Alberta Corn Committee 1983	0.20	0.10
Screening fungicides for efficacy against Sclerotinia white mold on dry beans	Brooks Bow Island	R. Howard	A.H.R.C.	Ongoing. A.H.R.C. Annual Report 1983 Alta. Pulse Crop Advisory Comm. A.H.R.C. Pamphlet 84-10 E.C.P.U.A. Pesticide Research Report 1983	0.05	0.05

SPECIAL CROPS (continued)

PROJECT TITLE	TRIAL LOCATION	RESEARCHERS	AGENCY	STATUS AND REPORTED	PMY	TMY
Root diseases of pulse crops (F.F.F.)	Brooks Bow Island Coaldale	K. Howard T. Swanson R. Rennie G. Flores J. Carson	A.H.R.C. F.F.F. C.D.A., Lethbridge A.E.C., Vegreville A.S.F.T.L.	Ongoing trials. A.H.R.C. Annual Report 1983 E.C.P.U.A. Pesticide Research Report 1983 C.H.C. Report 1983 Alta. Pulse Crop Adv. Com. Proc. Can. Phytopath. Soc. Plant Path. Soc. Alberta A.H.R.C. Pamphlet 84-10	1.25	1.50

ORNAMENTALS, TREES AND SHELTERBELTS

PROJECT TITLE	TRIAL LOCATION	RESEARCHERS	AGENCY	STATUS AND REPORTED	PMY	TMY
Woody ornamentals	Brooks	B. Casement	A.H.R.C. W.C.S.H. P.F.R.A. Nurseries Agr. Canada Morden	Active. Report to W.C.S.H. A.H.R.C. Annual Report 1983 A.H.R.C. Summary Report 84-3	0.34	1.00
Annual and perennial flowers	Brooks	B. Casement	A.H.R.C. All America Selections	Active. Report to A.A.S. and Seed Companies A.H.R.C. Summary Report 84-4 A.H.R.C. Annual Report 1983	0.21	0.65
Nursery production of woody ornamentals	Brooks	B. Casement	A.H.R.C.	Active A.H.R.C. Annual Report 1983	0.30	0.70
Overwintering trials of containerized nursery stock	Oliver	H. Oosterhuis C. McIsaac F. Straka	A.T.N. & H.C.	Ongoing.	0.10	0.15
Monitoring of transplanted container grown evergreens	Oliver	H. Oosterhuis F. Straka	A.T.N. & H.C.	Ongoing.	0.05	0.10
Germination testing of hawthorn seeds	Oliver	H. Oosterhuis A. Straka	A.T.N. & H.C.	Completed.	0.05	0.05
Seed propagation testing native species INV 30	Oliver	G. Grainger P. King	A.T.N. & H.C. E.N.R.	Active	0.10	0.20

ORNAMENTALS, TREES AND SHELTERBELTS (continued)

PROJECT TITLE	TRIAL LOCATION	RESEARCHERS	AGENCY	STATUS AND REPORTED	PMY	TMY
Container stock media test INV 28	Oliver	G. Grainger	A.T.N. & H.C.	Ongoing.	0.05	0.10
Container vs. Bareroot Evaluation INV 42	Oliver Brooks	G. Grainger B. Casement H. Oosterhuis	A.T.N. & H.C. A.H.R.C. A.T.N. & H.C.	Active.	0.05	0.05
Seed Evaluation INV 47	Oliver	G. Grainger	A.T.N. & H.C.	Active.	0.05	0.05
Handling and storage of nursery stocks	Brooks Oliver Lacombe Strathmore Coaldale	T. Krahn	A.H.R.C.	Active. A.H.R.C. Annual Report 1985 Evaluation of 83/84 material will complete.	0.10	0.15
Screening poplar cultivars for resistance to winter injury and bud-gall mites	Brooks	R. Howard B. Casement	A.H.R.C.	Not reported in 1983.	0.01	0.02
Regional woody plant hardiness test program	Various Alta. Sites	LANTA Growers B. Casement H. Oosterhuis G. Grainger	LANTA A.H.R.C. A.T.N. & H.C.	Active.	0.15	0.25

FRUIT CROPS

PROJECT TITLE	TRIAL LOCATION	RESEARCHERS	AGENCY	STATUS AND REPORTED	PMY	TMY
Bush and native fruit culture and cultivar improvement	Brooks Oliver	S. Mahadeva G. Grainger	A.H.R.C. A.T.N. & H.C.	Active. A.H.R.C. Annual Report 1983 A.H.R.C. Pamphlet 84-8	0.20	0.60
Tree fruit culture and cultivar improvement	Brooks 31 locations in province	S. Mahadeva	A.H.R.C.	Active. A.H.R.C. Annual Report 1983 A.H.R.C. Pamphlets 84-7 & 84-9	0.10	0.40
Conservaton bundle production	Brooks	S. Mahadeva	A.H.R.C.	Active to 1983. Project transferred to A.T.N. & H.C.	0.01	0.25
Native fruit pilot project	Sexsmith Manning Fairview	S. Mahadeva L. Spangelo G. Grainger	A.H.R.C. Agr. Canada Beaverlodge A.T.N. & H.C.	Active.	0.10	-
Small fruit culture and cultivar improvement	Brooks	S. Mahadeva	A.H.R.C.	Active. A.H.R.C. Annual Report 1983 A.H.R.C. Pamphlet 84-8	0.25	0.75
Processing and quality evaluation of fruits	Brooks	T. Smyrl	A.H.R.C.	Active.	0.02	0.04
Native fruit utilization	Brooks	T. Smyrl	A.H.R.C.	Active.	0.15	0.10

VEGETABLES & POTATOES

PROJECT TITLE	TRIAL LOCATION	RESEARCHERS	AGENCY	STATUS AND REPORTED	PMY	TMY
Bulb crops cultural and cultivar trials	Brooks	P. Ragan	A.H.R.C.	A.H.R.C. Annual Report 1983 A.H.R.C. Pamphlet 84-1, 84-2	0.20	0.30
Cole crop cultural and cultivar trials	Brooks	P. Ragan	A.H.R.C.	A.H.R.C. Annual Report 1983 A.H.R.C. Pamphlet 84-1, 84-2	0.20	0.25
Pea and bean cultural and cultivar trials	Brooks	P. Ragan	A.H.R.C.	A.H.R.C. Annual Report 1983 A.H.R.C. Pamphlet 84-1, 84-2	0.25	0.25
Sweet corn cultivar trials	Brooks	P. Ragan	A.H.R.C.	A.H.R.C. Annual Report 1983 A.H.R.C. Pamphlet 84-1, 84-2	0.05	0.05
Root crop cultural and cultivar trials	Brooks	P. Ragan	A.H.R.C.	A.H.R.C. Annual Report 1983 A.H.R.C. Pamphlet 84-1, 84-2	0.02	0.05
Solanaceous vegetable cultural and cultivar trials	Brooks	L. Hausher P. Ragan	A.H.R.C.	A.H.R.C. Annual Report 1983 A.H.R.C. Pamphlet 84-1, 84-2	0.01	0.20
Vegetable mulch and tunnel trials	Brooks	L. Hausher	A.H.R.C.	A.H.R.C. Annual Report 1983 A.H.R.C. Pamphlet 84-1, 84-2	0.25	0.40
Vine crop cultivar and cultural trials	Brooks	L. Hausher	A.H.R.C.	A.H.R.C. Annual Report 1983 A.H.R.C. Pamphlet 84-1, 84-2	0.15	0.40
Perennial vegetable cultivar and cultural trials	Brooks	L. Hausher	A.H.R.C.	A.H.R.C. Annual Report 1983 A.H.R.C. Pamphlet 84-2	0.01	0.10
Handling and storage of vegetables	Brooks	T. Krahn	A.H.R.C.	A.H.R.C. Annual Report 1983	0.10	0.15

VEGETABLES & POTATOES (continued)

PROJECT TITLE	TRIAL LOCATION	RESEARCHERS	AGENCY	STATUS AND REPORTED	PMY	TMY
Processing and quality evaluation of vegetables	Brooks	T. Smyrl	A.H.R.C.	Active.	0.20	0.20
Chemical aspects of carrots in storage	Brooks	T. Smyrl T. Krahn	A.H.R.C.	Active.	0.05	0.10
Processing and quality evaluation of potatoes	Brooks	T. Smyrl S. Molnar	A.H.R.C.	Active. A.H.R.C. Annual Report 1983	0.15	0.50
Potato cultivar improvement	Brooks Grande Prairie	S. Molnar R. Howard T. Smyrl D. Lynch	A.H.R.C. Agr. Canada Lethbridge	Active. Several types of trials A.H.R.C. Annual Report 1983 1983 Progres Report to Prairie Regional Potato Trial Group. National Potato Breeding Report 1983 (U.S.A.)	0.35	0.95
Potato production research	Brooks	S. Molnar	A.H.R.C.	Active. Several cultural trials under one heading A.H.R.C. Annual Report 1983 A.H.R.C. Pamphlet 84-10	0.25	1.00
Handling and storage of potatoes	Brooks	T. Krahn	A.H.R.C.	Active. A.H.R.C. Annual Report 1983 1983/84 Projects on Hold	0.25	0.20
Control of sclerotinia white mold on carrots by crop rotation	Brooks	R. Howard P. Ragan	A.H.R.C.	Concluded.	0.01	0.02

VEGETABLES & POTATOES (continued)

PROJECT TITLE	TRIAL LOCATION	RESEARCHERS	AGENCY	STATUS AND REPORTED	PMY	TMY
Diseases of potatoes	Brooks	R. Howard S. Molnar D. Lynch	A.H.R.C. Agr. Canada Lethbridge	Ongoing. A.H.R.C. Annual Report 1983	0.10	0.10
Susceptibility of commonly grown potato cultivars to bacterial ring rot	A.T.N. & H.C. - Oliver Agr. Canada - Vancouver	S. DeBoer I. Evans J. Stenrue	Agr. Canada Crop Protection	Ongoing.	0.10	0.30

GREENHOUSE CROPS AND GREENHOUSE ENERGY

PROJECT TITLE	TRIAL LOCATION	RESEARCHERS	AGENCY	STATUS AND REPORTED	PMY	TMY
Culture of greenhouse vegetable crops	Brooks	M. Mohyuddin	A.H.R.C.	Active. Several trials	0.25	1.20
Culture of greenhouse floriculture and foliage crops	Brooks	M. Mohyuddin	A.H.R.C.	Active. Several trials	0.10	0.40
Evaluation of hydroponic systems for growing greenhouse crops	Brooks	M. Mohyuddin	A.H.R.C.	Active.	0.05	0.30
Greenhouse energy conservation	Brooks Redcliff	C. Schaupmeyer	A.H.R.C.	A.H.R.C. Annual Report 1983	1.00	-
Diseases of greenhouse crops	Brooks	R. Howard M. Mohyuddin	A.H.R.C.	Ongoing and new trials. A.H.R.C. Annual Report 1983	0.05	0.75
Evaluation of chemical and biological agents to control greenhouse whiteflies	Brooks Redcliff Medicine Hat	M. Mohyuddin U. Soehngen M. Steiner	A.H.R.C. A.H.R.C. A.E.C. Vegreville	Ongoing and new trials. Alta. Greenhouse Newsletter. A.H.R.C. Annual Report 1983	0.20	0.10

Soil Management - Fertilizers - Analysis

PROJECT TITLE	TRIAL LOCATION	RESEARCHERS	AGENCY	STATUS AND REPORTED	PMY	TMY
Making the most of nitrogen. F.F.F. involving cooperators in Agriculture Canada, private industry and University of Alberta.	Alberta	D. Laverty D. Penney	Soils Branch Soil-Feed Lab	Active. Initiated in 1979 Progress Report 1983 Final Report 1984	0.20	1.50
Assessment of deep plowing, ripping (24") and liming as a method of reclaiming solonetzic soils	Alberta, mainly SE of Edmonton	J. Lickacz	Soils Branch	Initiated 1978 Progress Report 1983 Continued in 1984	0.25	0.50
Fertilizer requirements of irrigated soft wheat	5 locations in southern Alta.	R.H. McKenzie	Soils Branch	Ongoing.	0.10	0.20
Fertilizer requirements of irrigated barley	2 locations	R.H. McKenzie	Soils Branch	Ongoing.	0.05	0.10
Fertilizer requirements of dryland barley	1 location	R.H. McKenzie	Soils Branch	Ongoing.	0.05	0.10
Fertilizer requirements of irrigated durum	1 location	R.H. McKenzie	Soils Branch	Ongoing.	0.05	0.10
Fertilizer requirements of irrigated alfalfa (forage)	1 location	R.H. McKenzie	Soils Branch	Ongoing.	0.05	0.10
Fertilizer requirements of irrigated alfalfa (seed)	1 location	R.H. McKenzie	Soils Branch	Ongoing.	-	0.05
Fertilizer requirements of irrigated grain corn	2 locations	R.H. McKenzie	Soils Branch	Ongoing.	0.05	0.20
Fertilizer requirements of irrigated field beans	2 locations	R.H. McKenzie Refe Gaudiel	Soils Branch A.H.R.C.	Ongoing.	0.05	0.10

SOIL MANAGEMENT - FERTILIZERS - ANALYSIS (continued)

PROJECT TITLE	TRIAL LOCATION	RESEARCHERS	AGENCY	STATUS AND REPORTED	PMY	TMY
Fertilizer requirements of irrigated dry peas	2 locations	R.H. McKenzie Refe Gaudiel	Soils Branch A.H.R.C.	Ongoing.	0.05	0.10
Fertilizer requirements of irrigated sunflowers	1 location	R.H. McKenzie Refe Gaudiel	Soils Branch A.H.R.C.	Ongoing.	0.05	0.10
An evaluation of the effectiveness of snow trap swathing for moisture enhancement	Region II	D. Chanasyk C. Gietz J. Hermans	U. of Alberta Conservation & Development	Initated 1982 Continued 1984.	0.05	0.10
Hydrologic model for soil/land management in the Peace River region	Peace Region	D. Chanasyk E. Rapp J. Verschuren P. Crown J. Hermans C. Gietz	U. of Alberta Conservation & Development	Initiated 1980 Final Report 1984 (July)	0.20	1.00
Compilation and evaluation of Alberta soil data for crop production - provincial part of Canadian CANSIS program	Alberta	J. Carson L. Kryzanowski	Soils Branch Soil-Feed Lab	Active. Continue in 1984.	0.04	0.10
Deep plowing of solonetzic soils - chemical aspects	Alberta, mainly SE of Edmonton	J. Lickacz J. Carson	Soils Branch Soil-Feed Lab	Initiated 1977 Progress Report 1983 Continued in 1984	0.20	0.50

WEED CONTROL

PROJECT TITLE	TRIAL LOCATION	RESEARCHERS	AGENCY	STATUS AND REPORTED	PMY	TMY
Herbicide trials and evaluations INV 39	Oliver	G. Grainger	A.T.N. & H.C.	Ongoing. Complete File # INV 37,38,40	0.05	0.05
Weed control in pulses and spices	Brooks Bow Island	R. Esau	A.H.R.C.	Active. A.H.R.C. Annual Report 1983 Expert Committee on Weeds	0.25	0.25
Chemical weed control for nursery crops and shelterbelts	Brooks	R. Esau	A.H.R.C.	Active. A.H.R.C. Annual Report 1983 Expert Committee on Weeds	0.20	0.15
Chemical weed control in small and native fruit	Brooks	R. Esau	A.H.R.C.	Active. A.H.R.C. Annual Report 1983 Expert Committee on Weeds	0.02	0.02
Weed control in vegetable crops	Brooks	R. Esau	A.H.R.C.	Active. A.H.R.C. Annual Report 1983 Expert Committee on Weeds Can. Hort. Council	0.25	0.28
Weed control in potatoes	Brooks	R. Esau	A.H.R.C.	Active. A.H.R.C. Annual Report 1983 Expert Committee on Weeds Can. Hort. Council	0.20	0.23
Herbicide residues in crop rotation	Brooks	R. Esau	A.H.R.C.	A.H.R.C. Annual Report 1983 Expert Committee on Weeds	0.08	0.07

WEED CONTROL (continued)

PROJECT TITLE	TRIAL LOCATION	RESEARCHERS	AGENCY	STATUS AND REPORTED	PMY	TMY
Weed control trial and demonstration opportunities	Province-wide	D. Maurice D. Cole	Crop Protection Branch	Ongoing.	0.40	0.50
The effect of herbicides on several forage species	Barrhead	D. Maurice J. Moyer L. Darwent	Crop Protection Branch Agr. Canada	Initiated 1983 Continued.	0.20	0.40
Herbicide screening trial for knotweed control	Oyen	D. Maurice D. Cole	Crop Protection Branch	Ongoing. Annual Reports to Expert Committee on Weeds	0.10	0.25
Roadside weed control	Province-wide	D. Maurice T. Footz	Crop Protection Branch	Initiated 1983 Continued.	0.10	0.10
Equipment evaluation	Province-wide	D. Maurice T. Footz	Crop Protection Branch	Initiated 1984	0.10	0.15
Herbicide screening trial and cultural control of tall buttercup in pasture	Foothills	D. Maurice D. Cole	Crop Protection Branch	Initiated 1983 Continued	0.10	0.25
Control of blueweed in pasture	Pincher Creek	D. Maurice D. Cole	Crop Protection Branch	Initiated 1982 Annual Report to Expert Committee on Weeds	0.10	0.25

WEED CONTROL (continued)

PROJECT TITLE	TRIAL LOCATIONS	RESEARCHERS	AGENCY	STATUS AND REPORTED	PMY	TMY
Development of reclamation techniques for soil treated with residual herbicides	Tofield	D. Maurice	Crop Protection Branch	Initiated 1983 Continued.	0.10	0.25
Control of brush using aerially applied picloram and dicumban	6 locations in province	W.A. Stearman	Crop Protection Branch	Initiated 1979. In 1984 continue observations on brush control, soil residues, grass recovery.	0.005	-
Brush control and pasture renovation	M.D. of Bonnyville	W.A. Stearman	Crop Protection Branch	Initiated 1975-76. Continue observations on maintenance of brush control under light and heavy grazing pressure	0.005	-
Brush control and pasture renovation	County of Athabasca	W.A. Stearman	Crop Protection Branch	Initiated 1978. Continue observation on brush regrowth.	0.005	

APICULTURE/ENTOMOLOGY

PROJECT TITLE	TRIAL LOCATION	RESEARCHERS	AGENCY	STATUS AND REPORTED	PMY	TMY
Honeybee management	Brooks, Scandia	U. Soehngen	A.H.R.C.	Active. A.H.R.C. Annual Report 1983	0.20	0.25
Alfalfa leafcutter management	Brooks	U. Soehngen	A.H.R.C.	Active. A.H.R.C. Annual Report 1983	0.05	0.05
Control of insects in greenhouse crops	Redcliff Medicine Hat	U. Soehngen	A.H.R.C.	Active. A.H.R.C. Annual Report 1983	0.15	0.15
Control of corn insects	Redcliff Medicine Hat	U. Soehngen	A.H.R.C.	Active. A.H.R.C. Annual Report 1983	0.40	0.40

VI. PUBLICATIONS

A. FIELD CROPS BRANCH

BULLETINS AND FACTSHEETS

- Varieties of Hay and Pasture Crops for Alberta
- Varieties of Cereal and Oilseed Crops for Alberta
- Canadian Alfalfa Varieties
- Dry Pea Production in Alberta
- Lentil Production in Alberta
- Forage Seed Purchasing Tips

REPORTS AND PAPERS

Salmon, D., Helm, J. and Mederick, F., 1984. Expansion of Winter Wheat, Winter Triticale and Spring Triticale Breeding in Central Alberta. Final report for Farming For The Future.

Mederick, F. Folkins, L., and Helm, J., 1984. Agronomic Research and Regional Variety Testing of Forage Varieties Recommended in Alberta. Final report for Farming For The Future.

NEWSLETTERS

- Nukrop News
- Forage Seed Notes
- Using Forage Seed Mixtures
- Spring Tame Pasture Management
- Savory Pasture Management

B. CROP PROTECTION BRANCH

PUBLICATIONS

- Guide to Weed Control in Alberta - Part I - Chemical
- Guide to Weed Control in Alberta - Part I - Chemical (Staff Use Only)
- The Alberta Beekeeping Manual. Agdex 616-4
- Guide to Weed Control in Alberta - Part IV - Weed Species (Limited Distribution)
- Guide to Chemical Weed and Insect Control in Sugarbeets. Agdex 171-605

COUNTRY GUIDE INSERTS

- Perennial Weed Control - Agdex 641-11
- Control of Grasshoppers in Alberta, 1983 - Agdex 622-4
- Guidelines for the Safe Use of Pesticides by Farmers - Agdex 607-2
- Common Barley Diseases in Alberta - Agdex 632-2

FACTSHEETS

- Chemical Control of Field Crops Insects, 1983 - Agdex 100-622

RESEARCH PAPERS

Dorrance, M.J., 1984. Rat Control in Alberta. Proc. Vert. Pest. Control, Vol. II.

Dorrance, M.J., 1983. A Philosophy of Problem Wildlife Management. The Wildlife Society Bulletin, Vol. II.

Butts, R.A., 1983. Insecticide Trials Against Lygus Bugs in Alfalfa. ECPA, Pg. 156.

Butts, R.A., 1983. Some Aspects of the Biology of Lygus Bugs Infesting Canola in the Peace River Region. Annual Meeting ENSOC, Regina, 1983.

Butts, R.A., 1983. Factors Influencing Lygus Bug Damage in Alfalfa Seed. Joint Meeting. Ent. Soc. Alta. & B.C., Oct. 1983, Penticton, B.C.

Butts, R.A., 1983. Alfalfa Pest Management in the Peace River Region. Annual Field day of the Alfalfa Seed Producers of Sask. July 1983, PA, Saskatchewan.

Butts, R.A., 1983. Insect Pest Management in Alfalfa Seed Growing in the Peace River Region, Jan. 1984, Calgary. Interprovincial Seed School.

The following papers were presented to the Expert Committee on Grain Diseases, February 1984, Edmonton:

P. Ellis, C. Louie and I.R. Evans. BCGD, 1984. Effect of Seed Treatments on Emergence of True Loose Smut and Common Root Rot of Barley.

P. Ellis, C. Louie and I.R. Evans. BCGD, 1984. Effect of Seed Treatments on Emergence, Common Root Rot and Yield of Barley.

P. Ellis, C. Louie and I.R. Evans. BCGD, 1984. Efficacy of Seed Treatment Fungicides and Canocote.

P. Ellis, C. Louie and I.R. Evans. BCGD, 1984. Coating for Control of the Seedling Disease Complex of Canola.

P. Ellis, C. Louie and I.R. Evans. ECGD, 1984. Effect of Seed Treatments on Emergence of Canola.

P. Ellis, C. Louie and I.R. Evans. ECGD, 1984. Evaluation of Seed Treatments on Control of Seedling Disease Complex of Canola.

C. SOILS BRANCH

PAPERS AND OTHER PUBLICATIONS

Kryzanowski, L. Soil Nitrogen Tests as Affected by Time of Sampling. Presented at Alberta Soil Science Workshop, February 1984.

Redshaw, E.S. and R. Weisenburger. Near Infrared Reflectance Spectro-Computer System Analysis Development. Presented at Expert Committee on Animal Nutrition Meeting, Winnipeg, May 1983.

Redshaw, E.S. Near Infrared Development - Progress Report. Presented at 4th Annual NIR Workshop, Logan, Utah, U.S.A., November 1983.

Harapiak, J.T. and D.C. Penney. Efficient Use of Nitrogen - The Nitrogen and Phosphorus Interaction. Presented at Alberta Soil Science Workshop, February 1984.

Bole, J.B., J.T. Harapiak, S.S. Malhi, and D.C. Penney. Regional and Environmental Influences on Nitrogen Use Efficiency. Presented at Alberta Soil Science Workshop, 1984.

Mahli, S.S., M. Nyborg, J.T. Harapiak, and D.C. Penney. Efficiency of Fall-Applied N as Influenced by Method of Placement and Date of Fall Application. Presented at Alberta Soil Science Workshop, February 1984.

Ashworth, J., S.S. Malhi, D.C. Penney, N.A. Flore, A.T. Blades, and A.M.F. Hennig. The Use of Nitrification Inhibitors in Attempts to Improve the Efficiency of Plant Uptake of Fertilizer-N and Soil Mineral-N. Presented at Alberta Soil Science Workshop, 1984.

McKenzie, R.H. 1983 Fertilizer Research Plot Summary.

FACTSHEETS

- Common Soil and Fertilizer Questions and Answers. Agdex 520-1 - D. Laverty
- The Nitrogen Soil Test. Agdex 533-1 - L. Kryzanowski
- How to Get the Most from Your Soil Test Results. Agdex 533 - J. Carson
- Alberta Fertilizer Guide. Agdex 541-1 - D.C. Penney

- Average Protein and Bushel Weight Values for Alberta Wheat Grain Varieties. Agdex 112/81-1 - A. Suleiman and E. Redshaw
- Average Protein and Bushel Weight Values for Alberta Oat Grain Varieties. Agdex 113/81-1 - A. Suleiman and E. Redshaw
- Average Protein and Bushel Weight Values for Alberta Barley Grain Varieties. Agdex 114/81-1 - A. Suleiman and E. Redshaw

COUNTRY GUIDE INSERT

- Understanding Soil Tests. Agdex 633-3

D. ALBERTA TREE NURSERY AND HORTICULTURE CENTRE

PUBLICATIONS

- Planting Shelterbelts and Farmstead Beautification
- Poisonous Plants (Revised)

FACTSHEET

- Laying Sod

NEWSLETTERS

- Nursery Notes - 4 issues
- Alberta Horticulturalist - 4 issues

MAGAZINE ARTICLES

- Prairie Landscape Magazine: Turfgrass Notice, Turfgrass Research, Prairie Turfgrass Conference
- Prairie Garden: Vegetables Without a Garden

E. ALBERTA HORTICULTURAL RESEARCH CENTER

PUBLICATIONS AND PRESENTATIONS - 1983

ABSTRACTS

In *Report of the Committee on Horticultural Research, Canadian Horticultural Council, March 1984.*

- *Woody plant hardiness trial. E.B. Casement*
- *Weed control in onions. R. Esau*
- *Weed control in potatoes. R. Esau*
- *Row spacing effect on chives and parsley. R. Gaudiel*
- *Effects of early spring seeding of sweet corn in combination with mulch and tunnels. L. Hausher*
- *Rhubarb commercial production trial. L. Hausher*
- *Nursery stock storage. T. Krahn*
- *Storage of herbaceous perennials. T. Krahn*
- *Water cooling: an alternative carrot storage technique. T. Krahn*
- *Saskatoon cultivars. S. Mahadeva*
- *June-bearer strawberry cultivars. S. Mahadeva*
- *Production of seedless cucumbers on rockwool. M. Mohyuddin*
- *Culture of Alstromeria Lily as a cut flower in Alberta. M. Mohyuddin*
- *Potato plant spacing trial. S. Molnar*
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- *Potato sucrose study. T. Smyrl*
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- *Postemergence weed control in processing peas.*
- *Broadspectrum weed control in potatoes.*
- *Weed control in potatoes - pre-emergence.*
- *Chemical weed control in raspberries.*
- *Fall treatments for weed control in established saskatoons.*
- *Weed control in newly planted saskatoons.*
- *Juniper tolerance to oxyfluorfen.*
- *Control of brome grass in shrub plantings.*
- *Weed control in willow plantings.*
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- *Evaluation of seed treatments for controlling seed - and soil borne bunt in winter wheat, 1983. B.J. Puchalski, K.J. Degenhardt and R.J. Howard.*
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- *Efficacy of three seed treatment fungicides for root rot and damping-off in processing peas. T.A. Swanson and R.J. Howard.*
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Hausher, L. 1983. 'Mulch and Tunnels on Vine Crops'. Annual Meeting of the Western Canadian Society for Horticulture, Winnipeg. February.

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Casement, E.B. 1983. 'Container Growing'. Landscape Alberta Convention and Trade Show, Banff. December.

Esau, R. 1983. 'Weed Control in Market Gardens'. Market Garden Short Course, Calgary and Edmonton. January.

Esau, R. 1983. 'Weed Control in Nurseries and Shelterbelts'. Pesticide Applicator's Course, Olds. February.

Gaudiel, R. 1983. 'Results of Zinc Studies in Southern Alberta'. Annual Seminar of the Pulse Growers' Association of Alberta, Taber. January.

Gaudiel, R. 1983. 'Sunflower Varieties and Varietal Selection'. Sunflower School, Bow Island. February.

Hausher, L. 1983. 'Vegetable Marketing in Alberta', 'Early Crop Production' and 'Alberta Strawberry and Raspberry Production'. Market Garden Short Courses, Edmonton, Calgary and Bonnyville. January and February.

Hausher, L. 1983. 'Displaying Produce at a Farmer's Market'. Annual Farmers' Market Seminar, Calgary. March.

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Mahadeva, S. 1983. 'Potential Bush Fruit Crops for the Peace River Region of Alberta'. Peace Country Small Fruit Growers' Society Meeting, Beaverlodge. July.

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Mohyuddin, M. 1983. 'Nutritional Management of Bedding Plants'. Greenhouse Media Management Workshop, Olds. January.

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Soehngen, U. 1983. 'Pollen Production and the Use of Pollen Supplements' and 'Honeybee Queens'. Calgary and District Beekeepers' Association, Calgary. January and February respectively.

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HONORS AND AWARDS

Mohyuddin, M. "Outstanding Achievement Award". Presented by the Alberta Greenhouse Growers' Association. November, 1983.

VII. PLANT INDUSTRY DIVISION
PROFESSIONAL STAFF LIST

Director	Dr. J. Wiebe
Executive Assistant	Mrs. Norma Lea

A. FIELD CROPS BRANCH

Head	Mr. D. Cooper
Head, Cereal and Oilseed Section	Mr. R. Nelson
Head, Forage and Special Crops Section	Mr. A. Sherman
Head, Research Section	Dr. J. Helm
Plant Breeder	Dr. D. Salmon
Annual Crops Agronomist	Mr. F. Mederick
Supervisor - Cereal Crops	Mr. M. McLelland
Supervisor - Oilseed Crops	Mr. P. Thomas
Supervisor - Seed Technology	Mr. B. Witbeck
Supervisor - Special Crops	Mr. R. Park
Supervisor, Forage Crops	Mr. M. Bjorge
Supervisor, Range Management	Mr. R. Wroe
Chairman - Alberta Forage Seed Council, Edmonton	Mr. M. Maisonneuve
Office Manager	Mrs. M. Glenn

B. CROP PROTECTION BRANCH

Head	Mr. K. Price
Supervisor - Plant Pathology	Dr. I.R. Evans
Supervisor - Entomology	Mr. M.G. Dolinski
Supervisor - Animal Pest Control	Mr. C.F. Barrett
Supervisor - Problem Wildlife	Dr. M.J. Dorrance (Effective Jan. 1/84)
Supervisor - Apiculture - Falher	Mr. D.N. MacDonald
Head, Regional Crops Laboratory - Olds	Mr. J.R. Letal
Regional Plant Pathologist - Fairview	Mr. P.J. Ellis
Regional Entomologist - - Fairview	Mr. R.A. Butts
Regional Supervisor Vertebrate Pests - Barrhead	Mr. R.C. Acorn
Regional Supervisor Vertebrate Pests - Lethbridge	Mr. P.H. Merrill
Regional Supervisor Vertebrate Pests - Vermilion	Mr. J.B. Bourne
Supervisor - Communication & Special Projects	Mr. W.A. Stearman
Supervisor - Weed Control & Herbicides	Mr. W. Yarish
Supervisor - Weed Research & Development	Ms. Denise Maurice
Supervisor - Urban & Industrial Vegetation Management	Mr. S. Ali
Pesticide Issues Co-ordinator	Dr. M. Hussain

C. SOILS BRANCH

Head	Mr. A.W. Goettel
Supervisor - Soil Fertility	Mr. D.C. Penney
Supervisor - Soil Management	Mr. J.M. Lickacz (Effective Jan. 1/84)
Soil Specialist - Irrigated Crops - Lethbridge	Mr. R.H. McKenzie
Regional Soil Specialist - Fairview	Mr. G.R. Coy

SOIL AND FEED TESTING LABORATORY

Director, Soil and Feed Testing Laboratory	Mr. D.H. Laverty
Soils Section Head	Mr. J.A. Carson
Soils Specialist	Mr. L.M. Kryzanowski
Plant and Animal Feed Section Head	Dr. E.S. Redshaw
Laboratory Supervisor (Plant & Feeds)	Dr. H. Hsu
Laboratory Supervisor (Soils)	Dr. A. Bollo-Kamara

D. ALBERTA TREE NURSERY AND HORTICULTURE CENTRE

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Shelterbelt Specialist, Supervisor of Production	Mr. H.T. Oosterhuis
Horticulture Extension Specialists, Urban & Rural Horticulture	Mrs. B. Vladicka
Horticulture Extension Specialist, Commercial Vegetable Crops	Mr. R.M. Trimmer (Retired Jan. 1984)
Sod & Home Garden Specialist	Mrs. L. Taylor

E. ALBERTA HORTICULTURAL RESEARCH CENTER

Director	Dr. J. Wiebe (To June 30/83)
	Mr. T.R. Krahn (From Oct. 1/83)
Head, Environmental Horticulture	Dr. S. Mahadeva
Research Horticulturist - Ornamentals	Mr. E.B. Casement
Research Horticulturist - Market Garden Crops	Mr. L.G. Hausher
Research Horticulturist - Greenhouse Crops	Dr. M. Mohyuddin
Research Horticulturist - Greenhouse Energy Use	Mr. C.A. Schaupmeyer
Head, Vegetable and Special Crops	Mr. S.A. Molnar
Research Horticulturist - Vegetable Crops	Mr. P. Ragan
Research Horticulturist - Special Crops	Dr. R. Gaudiel
Research Horticulturist - Special Crops (FFF)	Mr. G. Riemer
Head, Laboratory Services (To October 1, 1983)	Mr. T.R. Krahn
Research Horticulturist - Food Science	Dr. T. Smyrl
Research Horticulturist - Weed Control	Mr. R. Esau
Research Horticulturist - Apiculture/Entomology	Dr. U. Soehngen
Research Horticulturist - Plant Pathology	Dr. R.J. Howard
Research Horticulturist - Plant Pathology (FFF)	Mr. T. Swanson
Administrative Officer	Mr. H. Ellis
Farm Manager	Mr. E. Bordsent

F. REGIONAL PLANT INDUSTRY SUPERVISORS

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Region 2 - Airdrie	Mr. L.J. Welsh
Region 3 - Red Deer	Mr. W. Jackson
Region 4 - Vermilion	Mr. E.L. Treffrey
Region 5 - Barrhead	Mr. E. Lowe
Region 6 - Fairview	Mr. M. Rudakewich

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